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ASCORBIC ACID REQUIREMENTS IN PATIENTS WITH PEPTIC ULCER*

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BOSTON

THERE are several reasons for investigating the vitamin C nutrition of patients with peptic ulcer. It has been recognized for many years that the usual diets prescribed for patients with an ulcer may be deficient in ascorbic acid. Cases have been reported of the development of scurvy in patients who had followed such diets for a long time.[1, 2] Furthermore, it has been reported that guinea pigs have developed gastrointestinal ulcerations on diets low in or devoid of vitamin C.[3] In a preliminary study,[4] one of us (H. A. W.) found that the blood plasma in 90 per cent of patients undergoing treatment for peptic ulcer gave a low value for this vitamin. Archer and Graham[5] have reported similar findings.

In a discussion of the cause for these low values, Ingalls and Warren[4] suggested three possibilities, namely an inadequate intake of vitamin C, the destruction of the vitamin in the gastrointestinal tract before absorption could take place, and an increased utilization of the substance by the tissues.

The present report deals with the daily requirement for ascorbic acid of patients with an active duodenal ulcer. Van Eekelen,[6] Heinemann[7] and Van Wersch[8] have found that normal persons when saturated with vitamin C utilize from 0.70 to 0.84 mg. of the vitamin per kilogram of body weight per day. These figures represent the optimal requirements and are considerably greater than is necessary to protect against scurvy. Göthlin, Frisell and Rundqvist[9] have shown that 0.4 mg. per kilogram of body weight per day is sufficient to prevent abnormal capillary permeability. Furthermore, Van Eekelen reports that smaller amounts of vitamin C are utilized by the body when the level of tissue saturation decreases. Beyond the point of saturation, any excess of the vitamin is rapidly excreted in the urine.

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It has already been shown that in the presence of disease the body may utilize increased amounts of ascorbic acid. Heinemann,[10] as well as Heise and Martin,[11] has demonstrated that patients with tuberculosis utilize as much as two or three times the normal amount; hence it seemed desirable to determine the amount of vitamin C utilized by patients with active duodenal ulcer.

METHOD

Previous work suggests that the amount of ascorbic acid in the plasma may not give a good index of the degree of tissue saturation and is of little value in showing how much ascorbic acid is used by an individual. The saturation test devised by Van Eekelen[6] and by Heinemann[7] appears to yield an accurate index of the tissue saturation and enables one to determine how much of the vitamin is actually utilized by the tissues. Therefore this method has been used in carrying out the present study.

The test consists of saturating the body with vitamin C, allowing some days to elapse, during which time the patient receives only minimal amounts of ascorbic acid, and determining the amount necessary to resaturate the body. It is considered that a state of saturation exists when a moderate dose of ascorbic acid produces a very definite excretion into the urine.

During the period of the test ascorbic acid may be lost in either of two ways: through utilization by the tissues or by excretion in the urine. The amount that is utilized by the body can be readily estimated by determining the amount excreted in the urine and subtracting this from the total amount to bring the tissues to the second saturation. The amount of ascorbic acid which the body requires per day is obtained by dividing the amount of the vitamin which has been utilized by the number of days through which the test was run. The final result is ex-

pressed in terms of the number of milligrams of ascorbic acid per kilogram of body weight per day.

RESULTS

Saturation studies were carried out on 5 patients with active duodenal ulcers. They had been on diets presumably low in vitamin C for periods ranging from one week to seven years preceding their admission to the hospital. During the period of study all received either the first- or fourth-week Sippy diet, together with alkaline powders or colloidal aluminum hydroxide. The following daily requirements were found to be necessary to maintain saturation in the five patients: 1.20, 0.91, 1.10, 1.02 and 1.05 mg. of ascorbic acid per kilogram of body weight per day (Table 1).

TABLE 1. *Daily Requirements of Ascorbic Acid.*

SUBJECT	AGE	SEX	WEIGHT	ASCORBIC ACID REQUIREMENTS	
	yr.		kg.	mg. per day	mg. per kg. per day
B. L.	40	M	71.7	86.2	1.20
K. F.	50	M	54.7	57.6	1.05
R. F.	53	M	51.6	57.3	1.10
S. H.	43	M	59.2	60.9	1.02
M. A.	35	F	62.7	57.1	0.91

The average for this series was 1.02 mg. This is 20 per cent greater than Van Eekelen[6] and Heinemann[7] found for normal subjects. Since this investigation was started Heinemann[12] has reported similar studies of 4 patients with peptic ulcer. He also found a slightly higher requirement. The average of his 4 cases was 1.25 mg.

DISCUSSION

The findings in this study, together with those of Heinemann, show that patients with peptic ulcer utilize somewhat more ascorbic acid than do normal individuals. However, this increased amount is so small that it can be supplied by the juice of one or two good-sized oranges.

The fact that these patients utilize a somewhat greater amount of ascorbic acid makes it all the more necessary that their diet shall contain an adequate amount of this substance. It is also true that many of the diets which are used in the treatment of peptic ulcer are low in this vitamin. We have assayed the amount of ascorbic acid in the first-week Sippy diet and found that it contained approximately 5 mg. of ascorbic acid per day. The fourth-week Sippy diet contained approximately 15 mg. These amounts vary considerably depending on the amount and the freshness of the fruits and vegetables taken; however, they compare favorably with the estimated amount in such a dietary as calculated from published reports on the amount of ascorbic acid contained in foods. According to the figures obtained by us, a person with a duodenal ulcer, weighing 150 pounds, utilizes about 70 mg. of vitamin C a day. It seems evident that the low plasma values reported by others in cases of peptic ulcer may have been the result of a low intake. We have no reason to suspect that there was an abnormal destruction of the vitamin in the gastrointestinal tract, or any failure of absorption. Moreover, Heinemann administered the ascorbic acid by subcutaneous injection in 2 patients and found no difference in his results from the 2 other patients who received the vitamin by mouth. The inadequacy of the Sippy diet in maintaining saturation is also emphasized by the relatively large amounts of ascorbic acid needed to produce a second saturation in our patients. As much as 1800 mg. of ascorbic acid was required to resaturate a patient after receiving a Sippy diet for three weeks.

The question now arises as to how much ascorbic acid should be given to a patient with peptic ulcer. It is fair to say that there is no evidence in the clinical picture of peptic ulcer, and more particularly in the rapidity of healing of these ulcers under the Sippy regime of dieting and neutralization of gastric acidity by alkalies, to suggest ill effects from this deficiency in ascorbic acid. In our opinion there is no reason for complicating the dietary problem of the ulcer patient by the addition of foods rich in ascorbic acid or of ascorbic acid itself, until it is demonstrated that ulcers will heal faster and recur less under higher ascorbic acid intake. However, if the physician desires to increase the vitamin C intake this can easily be done by recommending doses in excess of that utilized by the body for several days and then prescribing amounts which the individual will utilize throughout the period of active treatment. One can give 200 mg. a day for a period of one or two weeks, depending on the previous intake of vitamin-C-containing foods, then 75 mg. a day for two or three weeks longer. At the end of this time a patient should be able to obtain an adequate amount of vitamin from his diet. If for any reason those foods which contain a large amount of vitamin C, such as orange juice and tomato juice, are contraindicated, the deficiency can be made up by prescribing crystalline ascorbic acid.

CONCLUSIONS

Studies have been made on the requirement of ascorbic acid by patients with peptic ulcer. It was found that 5 patients with duodenal ulcer utilized 20 per cent more ascorbic acid than do normal individuals. There was no evidence that they were

unable to absorb the drug when given by mouth. It was also found that these patients had been taking diets deficient in vitamin C. It is pointed out that the usual Sippy diet contains much less than the normal requirement of vitamin C. If it is desired to meet this deficiency it is easy to make up the vitamin C requirements by including in the daily diet the juice of one or two good-sized fresh oranges.

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FRACTURE OF THE FIRST RIB DUE TO MUSCLE PULL

Report of a Case

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FRACTURES of the first rib unassociated with other fractures are very rare. Breslin[1] has recently reviewed the literature and found 27 cases, to which he added 5 of his own. Lane[2] states that fracture of the first rib can take place in only one of three ways; by indirect violence, the force being transmitted through the clavicle; directly by means of force applied from behind; or indirectly, by force being transmitted through the manubrium.

Although most of the reported cases have been due to one of these mechanisms, there are 2 cases in the literature in which the fractures were said to be due to muscle pull.[3, 4] That fracture of the first rib can be due to muscle pull, particularly that of the scalenus anticus, is shown by the following case.

CASE REPORT

The patient was a well-developed and well-nourished white man 29 years of age. He had placed on his head a load of cardboard weighing approximately 50 pounds. Steadying the load with his right hand, he had climbed three steps of a stepladder when it suddenly tipped to the left. Endeavoring to maintain his balance, he jerked his head forcibly to the right, and as he did so felt a snap in the left side of the neck followed by severe pain, localized partly in the neck but chiefly over the posterior aspect of the left shoulder. He also experienced sharp pain radiating down the upper arm and the inner side of the forearm. With the onset of pain there developed immediate rigidity of the neck. Within 48 hours the acute pain subsided and the patient returned to work. The pain in the neck and shoulder and the stiffness persisted for the 1st week and then subsided. At the end of the 3rd week he was symptom-free. Twenty-six days following this injury the patient was in the act of pulling back a bedspread with his right hand when he again felt a violent snap in the left supraclavicular fossa followed by extreme pain felt chiefly over the posterior aspect of the left scapula. Any motion of the body, especially respiration, made the pain excruciating and caused it to radiate

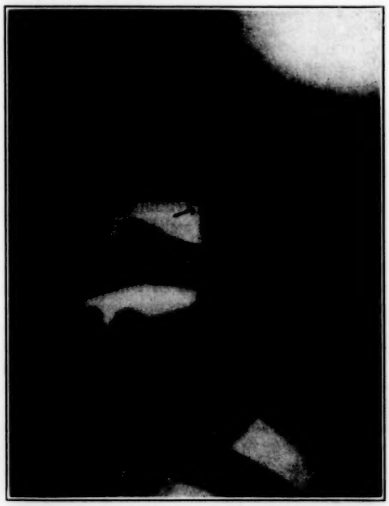

FIGURE 1. *Arrow points to fracture.*

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down the arm and the ulnar side of the forearm. The patient became faint and lay down. As he did so he felt a second snap in his neck. Immediately the acute pain in the shoulder subsided. However, rigidity recurred and motion of the head or arm caused pain in the supraclavicular fossa and over the posterior aspect of the shoulder, with some radiating pain down the ulnar side of the left arm and forearm. When the patient lay quietly, however, he had no pain but had some tingling in the fourth and fifth fingers of the left hand. X-ray photographs taken the day after the second attack of pain revealed a fracture of the first rib on the left side, at the point of insertion of the scalenus anticus muscle (Fig. 1).

With immobilization of the head and neck all the acute pain disappeared in a few days. Flexion and extension of the head became normal and painless. Lateral flexion to the left caused pain only when the normal limits of motion were reached. Lateral flexion to the right, however, was completely limited for several days, and any attempt to elicit this motion caused sharp pain over the posterior aspect of the shoulder joint which radiated down the inner side of the arm. At the end of 4 weeks all symptoms had subsided and pain was produced only when the full limits of right lateral flexion were reached. In 7 weeks the patient returned to work and has been symptom-free since then.

Because of the history of pain radiating down the left arm following sudden forced flexion of the neck to the right, it was at first thought that the patient was suffering from a scalenus anticus syndrome. The original x-ray photographs did not reveal the fracture of the first rib because of the overlying clavicle. However, films taken after the second onset of pain showed a distinct fracture.

Fractures of the first rib are unquestionably rare, and it is for this reason that this case is presented. Such fractures are not routinely looked for and are difficult to see because of the overlying clavicle. If an examination is made in cases where the patient complains of pain in the posterior aspect of the shoulder following direct or indirect trauma, it may be found that this lesion is not so uncommon as we now believe.

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TWENTY-FIVE NON-READERS*

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WE ARE slowly outgrowing the concept that the child who is slow in learning to read is either dull or mentally lazy. The psychologist has given us valuable assistance regarding reading disability, but there is still a greater contribution to make in remedial training. The visiting teacher and psychiatric social worker have indicated home situations which influenced school progress, and educators are now aware of the relation which exists between failure in learning to read and personality deviations which may develop later. Ideally, each child who experiences difficulty in learning to read should be subjected to an exhaustive analysis with the hope of finding the cause of the trouble. From a practical standpoint this is rarely done. To be sure, many schools give routine intelligence tests of one kind or another, but these are chiefly for the purpose of designating the group whose failure is due to intellectual limitations. The child of normal intelligence who is failing, particularly in reading, presents quite another problem. One authority[1] states, "In Grade 1, 99 per cent of the pupils failing promotion were marked as failures in reading; in Grade 2 the percentage was 90; in Grade 3 the percentage was 68." The importance of reading in its relation to school failure cannot be questioned.

The present study is not presented as a thorough analysis of a group of non-readers, but is intended rather to call attention to the multiplicity of factors which enter into the problem. Without doubt, learning to read is the most important single accomplishment in the early formal education of the child. Its importance can scarcely be overstressed in its relation either to other subjects in the curriculum or to the broader aspects of living. There is some danger that we may become a nation largely influenced by things we see and hear, and that the vast realm of knowledge which reading makes available will be of decreasing importance as a cultural factor in our daily lives.

The 25 children (19 boys and 6 girls) selected for this study include practically the entire group of non-readers in the first, second and third grades in the school under consideration, excluding those of less than average intelligence. It was our

*Part of a child-guidance project conducted in the public schools of Webster, Massachusetts, by the staff of the Worcester Child Guidance Clinic.

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opinion that those children who had not learned to read because they were not yet intellectually ready constituted a special group about which we had some definite knowledge. Any child with an I.Q. under normal limits was therefore excluded. All children had had eye examinations by the school physician and visual defects, when present, had been corrected.

The co-operation of the teachers was assured from the beginning, as they found these non-readers a source of considerable concern. In another study we had tried the questionnaire method of getting information, and this was abandoned because of the tendency on the part of the teacher to answer leading questions briefly and to avoid further elaboration. We therefore asked the teachers to write a report on each child, answering the following questions: Does the child like school? How does he get along with his classmates? Is he attentive in the classroom? Does he seem interested in classroom activities? What is his attitude toward failure? Do you consider him a leader or a follower? We established no criteria for the evaluation of these factors, and the objection may be raised that possibly more than the usual amount of subjectivity is involved.

The social workers interviewed the parents of the children, and without exception there was complete co-operation, not only in getting data for this study but in discussing findings and recommendations at its completion. The psychologist gave each child individual reading tests as well as hand-and-eye dominance tests. Each child was interviewed at least once by the psychiatrist after data obtained by others had been collected.

The following material is presented in order that a fair picture may be obtained of the family backgrounds of the children. Eleven fathers and eight mothers were foreign-born. This was in keeping with the population of the town concerned. A foreign language was spoken in ten of the twenty-four homes (2 children studied were from the same family). In three homes practically no English was spoken. One child never learned to speak English until he started school. Only three fathers and four mothers had an education above grammar school. Two parents were college graduates and two were illiterate. In eight families the parents had given some thought to the child's failure to learn to read and had decided that the school was to blame. Such an attitude is in no way conducive to learning on the part of the child. I suspect it occurs more often than we are aware.

It is often stated that reading, like speech, is born of necessity. We know that children will learn to talk when it becomes necessary for them to make their wants known. I have frequently questioned the advisability of parents' reading to children, thereby relieving them of the necessity of reading for themselves. Nineteen of the children in this study were read to by some member of the family; 14 of these 19 were classed by their teachers as "followers." It would seem that this is an indication of a higher percentage of dependency than we should ordinarily expect. Our findings are not conclusive, but they indicate the general trend.

It was not always possible to obtain detailed information on early development because of the intellectual limitations of the parents. Retardation in teething, walking and talking was noted in 6 children. Ten children were very difficult to train in toilet habits; 1 was untrained until he was three and 1 until after four. The latter phenomenon indicates inadequate methods used by the mothers, but there are other implications as well; it suggests an early personality deviation. The relation between toilet training and disobedience and negativism is well known. These children had had experience in developing a negativist attitude toward the things which adults expected of them. This negativism is of potential importance in failure to learn to read.

Timidity was an outstanding characteristic in 13 children. Lack of interest in school was noted in 10. The indications are that the pattern of dependence, timidity and lack of interest has its genesis in the home, and that these children are lacking in the curiosity and emotional drive so essential to reading.

The psychologist submitted the following report as to grades. Four children were in Grade 1, 13 in Grade 2, 7 in Grade 3, and 1 in Grade 4. The average age of the entire group was eight years, corresponding to the third grade, but instead the average was about Grade 2, so that the children were practically one year retarded with respect to chronological age. Furthermore, the group had an average reading grade of only 1.46. In other words, the children did no better in reading than average six-and-a-half-year-old children. Apparently they had stopped learning to read; yet it is certain that lack of intelligence was not the cause. All the children were tested in order to determine hand and eye dominance. The results, as compared with those ascertained in similar and normal groups of children, showed a preponderance of mixed dextrality, that is right-handedness and left-eyedness. In this study we believe that mixed dextrality was not a significant factor. Readers are referred elsewhere[2] for a complete discussion of the relation between handedness and reading.

The averages for the types of error that these children made in reading are shown in Figure 1.

Ten types of errors were classified: pronunciation of vowels (V), pronunciation of consonants (C), reversals (R), addition of sounds (As), omission of sounds (Os), substitutions (S), repetitions (Rp), addition of words (Aw), omission of words (Ow) and words whose pronunciation required aid from the teacher (Wa). The children taken as a whole showed marked difficulty in four directions: the pronunciation of vowels and of consonants, the insertion of extra sounds, and the pronunciation of many of the commoner words for which they demanded excessive help; the last-named obstacle was the most outstanding one. Objectively one might conclude that the last group was predominantly a help-seeking one, inclined to rely on others to conquer difficult situations.

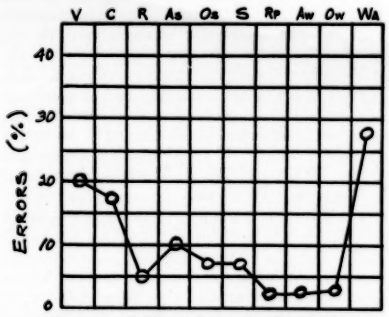

FIGURE 1. *Profile of Errors for the Group.*

All these children were interviewed at least once by the psychiatrist, and 17 were classified as immature. For example, one child would not talk; another put his fingers in his mouth and left them there throughout the interview, answering questions by affirmative and negative movements of the head. Several of the children cried, and others were almost in tears; one stated that he liked to be the baby of the family and did not wish to grow up. Some mental conflict was elicited in 15 children. Three families showed no affection for their children, who felt rejected and unloved. One child was given to relatives. Two children had mothers in mental hospitals, and were not only teased about this by their classmates but believed that they would never see their mothers again. Two children had seen their fathers strike their mothers in a drunken rage. One child was not allowed to play with other children on the street and had no friends. Again it is difficult to say more than that from a psychiatric standpoint these children were essentially unhappy, their minds being preoccupied with conflicts which they could not understand, and which interfered with their interest in learning. Spending only a few hours each day in the classroom, they were continually subjected to the molding influences of the home, whatever they might be.

The parents were interviewed at the school clinic by social workers, primarily to secure information about background, development, home conditions and attitudes, and with no thought of attempting treatment. Usually the mother was seen, but in several families where the father spoke better English he represented the parents, and in one case both father and mother came to the clinic. When the purpose of the study was explained to the parents, some became interested and asked for suggestions; some were apprehensive, in spite of assurances that no fault on their part or the children's was implied. With other parents, the social worker found herself interpreting some of the child's behavior, or suggesting that fewer comparisons be drawn between him and a precocious younger sibling. It was our opinion that later interviews with the parents might allay any anxiety which might have been aroused, help the relation between parents and school and in some cases modify parental attitudes that might be adversely affecting the child's schoolwork. The parents were promised that in return for their help we would later give them specific suggestions regarding their children.

The parents of all but 3 of the children came for the second interview. Some of them were no clearer about the purpose of the study than they had been in the beginning, and some were fixed in their belief that anything that was wrong was the fault of the school, or because the child had been sickly in infancy. A few had stopped reading so much to their children, or had given them more responsibility, and were pleased with the results; some were planning definitely for a change in their treatment.

After the director had made his general report to all the teachers in the school system, the teachers of the 25 non-readers requested individual reports and recommendations. The clinic staff went over its material, taking from the findings of the psychiatrist, the psychologist and the social worker what might be of practical help to the teacher. An example of such a report is as follows:

HELEN R.

ERRORS IN READING	%	DOMINANCE
Substitutions	25	Right-eyed
Addition of sounds	15	Right-handed
Addition of words	14	
Consonants	11	
Vowels	9	
Reversals	9	

Helen's mother is a cripple, barely able to walk. The child's father, in his sixties, is not well and keeps house. The older children at home baby Helen and read to her, and she likes this very much. The home is not giving her adequate physical care or training, and we believe that it is not surprising that the carelessness apparent in the child's physical appearance should also be evident in her reading habits. It is interesting that the father blames the school for all Helen's difficulties.

Recommendations. Drill calculated to correct the carelessness which we think is the most significant thing about her reading errors. Anything the school or the teacher can offer this child in the way of training in the amenities and in habits of order, neatness and good workmanship should be of value to her. While it is realized that what the school can do is necessarily limited, it is believed that in this case the school, because of the home situation, is a more important factor than it is in the case of the average child.

Recommendations for the School Nurse. Helen is badly in need of dental care and has tonsils which are enlarged and should be removed. We think that the Health Department should give serious consideration to having this home supervised, perhaps by a state worker.

These reports were taken to the individual teachers and discussed with them. At the same time the teachers reported on the adjustment and progress of the children. Possibly one of the most valuable by-products of the study is the absolving of the teacher of blame for all the children's failures, with the result that she can attack the problem with added energy. Certainly the improvement that some of these children have made can be directly attributed to the teacher's changed perspective and fresh efforts.

In conclusion, failure of this group of children to keep pace in reading appears to be a personality problem centering around emotional conflict and lack of maturity. They are the younger children in the family, have been read to by parents and older siblings and have developed dependent and submissive traits. Lack of interest in school indicates a willingness to continue in the dependent role. This may be influenced to some extent by the presence of negativism, which is a carry-over from the child's early training. We are giving an increasing amount of attention to the significance of conflict as an important factor in personality development. If conflict generates a sufficient amount of unhappiness and feeling of difference, it will influence the learning process as well as other aspects of the child's personality development. The reactions of this group are in keeping with our observations on the importance of conflict in similar age groups. Proof is lacking that the failures in learning to read are assignable to any specific cause. On the contrary, we must consider the multiplicity of factors which influence the personality in its attempts at adjustment, whether it be learning to read or some other adjustive processes vital to the individual.

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REPORT ON MEDICAL PROGRESS

PHYSIOLOGY*

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THE past year has been distinguished not only by advances in research and in the application of physiological principles to clinical problems, but also by the appearance of several publications of more than passing interest. The first of these is the new *Annual Review of Physiology,*[1] a worthy companion to the *Annual Review of Biochemistry.* Presenting as it does a broad view of the year's advances in physiology, it is a valuable complement to *Physiological Reviews,* which undertakes to give an exhaustive survey of particular fields. The editors have wisely attempted to secure critical appraisal of the assigned topics, rather than a simple catalogue of work done, and in a large measure they have been successful. The reviews by Bozler on muscle, Davis on electrical phenomena of the brain and cord, Eccles on the spinal cord and reflex action, and Bronk and Brink on bioelectrical studies of the excitation and response of nerve are particularly admirable in this respect, and are especially valuable for the light they throw, from the special viewpoint of their authors, on the common problems of excitation and transmission.

Even more recently has appeared the second edition of the classic *Sex and Internal Secretions,*[2] again under the editorship of Dr. Edgar Allen. Each of the three sections, dealing with the biological basis of sex, the physiology of the sex glands, germ cells and accessory organs and the biochem-

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istry and assay of gonadal hormones, is worthy of a separate volume, and if the importance of each subject increases in the future as it has in the past, the sections will no doubt demand separate publication in future editions. As in the *Annual Review of Physiology*, the usefulness of the book depends on the evaluation of work rather than on the mere compilation of titles, and there is more than a suggestion that in both volumes, with certain notable exceptions, the value of individual chapters is inversely proportional to the length of the bibliography.

Among the more specialized monographs, Stevens and Davis's[3] *Hearing: Its psychology and physiology* and Fulton's[4] *Physiology of the Nervous System* deserve mention. The first is the result of a fruitful collaboration between a psychologist and a physiologist, and effectively bridges the gap which often separates these fields. The book is remarkable for its emancipation from classical theorizations and for the ability of the authors to synthesize the material gained from study of small units and isolated phenomena into a unified account. The second is a welcome addition to the series "Outlines of Physiology," published by the Oxford University Press. This book presents a reasoned account of the functions of the cord and brain stem; it is historically well oriented, gives a judicious evaluation of the huge mass of modern work and is based primarily on the author's own investigations and collaborations in a wide variety of problems presented by the central nervous system.

THE ROLE OF IONS IN PHYSIOLOGIC PROCESSES

The past few years have seen an intensification of interest in the function of ions in a variety of physiologic processes; this is particularly true of the potassium ion. The studies of Ringer[5, 6] long ago emphasized the importance of this ion in maintaining normal cardiac contractility and automaticity, and the influence of preponderance or deficiency of other ions. Howell[7] called attention to changes in potassium during vagal inhibition of the heart, determined the influence of low and high potassium on the action of the vagus on the heart and concluded that the vagus may inhibit that organ by changing the concentration of potassium. As long ago as 1900, Macdonald[8] suggested that the action current in nerves was caused by a difference in the concentration of potassium ions inside and outside the nerve membrane, and the recent work of Osterhout and his collaborators[9] and of Cowan[10] has supported this view. An influence of calcium and potassium on the recovery process in nerve, as shown by its effect on the afterpotentials, has also been demonstrated.[11, 12] Potassium is also clearly implicated in neuromuscular transmission and in muscular contraction. Its anticurare-like action has been noted by several investigators,[13, 14] and Brown and von Euler[15] have suggested that liberation of potassium ions is responsible for the phenomenon of post-tetanic potentiation, which is characterized in part by the facilitation of neuromuscular conduction by a tetanus. Bronk and others[16–19] have demonstrated that potassium has a similar facilitating influence on ganglionic transmission. Largely through the work of Fenn,[20] it is now well known that muscle loses potassium during contraction and regains it during rest. Wilson and Wright[13] have shown that intra-arterial injection of potassium salts increases the vigor of contraction in normal and denervated muscles, and Brown[21] has shown that in sufficient concentration they evoke tetanic discharge in the muscle. Wilder and his colleagues[22] have called attention to the importance of potassium in adrenal insufficiency, and have shown that an increased intake of potassium precipitates attacks. Serum potassium may or may not be elevated in Addison's disease, but is markedly elevated in experimental insufficiency. In such conditions of adrenal insufficiency the concentration of intramuscular potassium is found to increase markedly, while liver potassium fails to show any increase. Harrison and Darrow[23, 24] have shown that the cure of adrenal insufficiency by the injection of the adrenocortical hormone or by administration of sodium chloride and sodium bicarbonate in hypertonic solutions is followed by return to normal of the intramuscular potassium. This action may be related to a direct effect of the hormone on the potassium metabolism within the muscle, or to alterations in the renal excretion of potassium during adrenocortical insufficiency. It is now well established that familial periodic paralysis is associated with low serum potassium during attacks. Ingestion of potassium, according to Aitken and others,[25–29] relieves and prevents attacks, while measures which lower serum potassium, such as the administration of insulin and glucose, produce attacks of paralysis. The function of potassium in the muscle may also be associated with carbohydrate metabolism. Injection of potassium has been found by Silvette, Britton and Kline[30, 31] to produce a marked rise in blood sugar at the expense of liver and muscle glycogen. Kendall[32] reports that when cortical extract is given to a rat with high blood sugar resulting from partial pancreatectomy, a marked excretion of potassium takes place, while the administration of potassium greatly increases the glycosuria. The drop in serum potassium following insulin injections in man and animals has been recognized for some time.[33–35]

Only recently the increased level of serum potassium in Addison's disease and in nephritis has

been found to be accompanied by changes in the T wave of the electrocardiogram similar to those evoked by increasing the serum potassium in experimental animals by intravenous injection of isotonic potassium chloride solution.[36, 37] The electrocardiograms of dogs with high serum potassium after adrenalectomy show similar changes.[38] The observation that ischemic hearts lose potassium lends some support to the view that the alterations of the electrocardiogram in acute coronary thrombosis may be due in part to alterations in the serum or heart-muscle potassium.[39] A high concentration of potassium in solutions perfusing coronary arteries is reported[40] to produce constriction amounting almost to occlusion. The suggestion has also been made that changes in nerves and muscles induced by asphyxia may also be due to altered ionic concentrations.[41, 42]

An important new method for the study of the distribution of ions in the tissue is the use of radioactive isotopes by means of which the course of administered ions may be followed. Hamilton[43] has already studied the absorption of radioactive sodium, potassium, chlorine, bromine and iodine in man and Brooks[44] has followed the accumulation of potassium in Valonia by this method. It has also been found[45, 46] that the radioactive salts behave in the body like the non-active material, thus disproving the old hypothesis of Zwaardemann that the physiologic properties of potassium are due to its natural radioactivity.

THE CIRCULATION

The fundamental observations of Goldblatt have established firmly the fact that permanent hypertension may be provoked by limitation of the renal circulation to a degree insufficient to produce local necrosis. Sympathectomy does not relieve the excessive blood pressure.[47] The evidence seems conclusive that a humoral mechanism is responsible for the elevated blood pressure,[48–50] and investigators have found pressor substances in normal kidneys, and in greater amounts in ischemic kidneys.[51–56] The failure of permanent hypertension to develop when one kidney only is rendered ischemic and the onset of permanent hypertension when the normal kidney is later removed suggest strongly that a normal kidney can remove or inactivate the material responsible for the hypertension.[57] Increasing the blood supply to the ischemic kidney by establishment of collateral circulation with the omentum has been reported to cure experimental hypertension.[58] Reviews by Goldblatt[59] and Graybiel and White[60] are particularly valuable.

Recent studies suggest that it is unlikely that the adrenal cortex is involved specifically in the etiology of experimental hypertension, other than in the sense that the cortex is important in the maintenance of blood pressure in normal as well as in hypertensive states.[61, 62]

Viewed in the light of the enormous importance of adequate renal circulation, great interest attaches to the recent studies of the renal excretion in man of foreign substances such as inulin and Diodrast. Smith and his co-workers[63, 64] have shown that in the normal human being these substances are excreted by the kidneys in amounts to require a blood flow through the kidney of nearly 1500 cc. of blood per minute (1050 to 1680 cc. per minute in thirty-four observations on 15 subjects). Additional evidence indicates that this does not represent a maximum, but that vasodilating procedures may increase and vasoconstricting procedures may decrease these normal figures.[63, 64] Stated in terms of the figures usually given for cardiac output at rest, it means that from a third to a fourth of the blood ejected by the heart passes through the kidneys.

There are various other experimental procedures which may evoke hypertension in animals. Many of these are reviewed in the Dunham Lectures by Heymans.[65–67] An important contribution to an allied subject, the hypotension of wound shock, is that of Freeman and his associates,[70] calling attention to the role of the sympathetic nervous system in precipitating the shock syndrome.

Early observations by Bayliss[71–73] showed that stimulation of the dorsal roots produced a vasodilatation in the skin area supplied by the root stimulated. He explained the phenomenon on the basis of a dichotomy of the afferent fibers in the skin, one branch going to a sense organ and the other to a blood vessel. Normally this provided the anatomical basis for an "axon reflex." The sense organ being stimulated, impulses are sent along the fiber toward the spinal cord; when they reach the point where the axon collateral occurs they also travel down it to the blood vessel, which they cause to dilate. This mechanism was later identified in the "triple response" by Sir Thomas Lewis, who found that the "flare" was mediated by such axon reflexes.

Bayliss interpreted his own observations by suggesting that when he stimulated the dorsal roots, impulses traveled down the afferent fibers of the dorsal roots in the opposite direction to their normal course, that is antidromically. Impulses thus eventually reached the axon collateral and produced dilatation. Since that time a great number of investigators have been dissatisfied with this explanation, and have sought to detect in the dorsal roots true efferent fibers with cell stations

within the spinal cord which might mediate reflex vasodilatation. A great mass of material, reviewed some time ago by Sheehan,[74] yielded entirely inconclusive evidence. This year, however, Toennies,[75] working in Gasser's laboratory, obtained evidence of what seemed to be true reflex discharge emerging from the spinal cord via the dorsal roots. A stimulus being delivered to a group of afferent fibers discharges appeared in the dorsal roots after a period of latency comparable with that of other spinal reflexes. The classical characteristics of reflex discharge could be demonstrated: central latency, facilitation, after-discharge, and so forth. Most conclusive was the demonstration that impulses could be recorded in fibers other than those in which the afferent impulses traveled to the cord, on the same or opposite sides of it.

These remarkable experiments, which seemingly overthrow the classic doctrine of Bell and Magendie, which postulates that efferent or motor discharge occurs only via ventral root fibers, while afferent impulses enter only along dorsal root fibers, are too recent to have been thoroughly discussed by other workers. Preliminary accounts have only recently appeared describing certain differences in modifying conditions.[76, 77] It appears that a subnormal temperature is required to obtain these reflexes, and that at body temperature they may not be found. The suggestion has been made that they are largely artefacts, in the sense that they represent the stimulation of the dorsal-root nerve endings rendered abnormally sensitive by cold, through the negative cord potentials known to exist following afferent stimulation and apparently responsible for the normal reflex activity following such stimulation. It seems to be a matter of some doubt, therefore, whether these reflexes can represent the functioning of the postulated "dorsal root efferents" in vasodilator reflexes; on the other hand, it is equally probable that study of these effects will shed a great deal of light on the normal physiology of reflex activity in the cord.

Some other evidence also suggests that the dorsal roots are not involved in reflex vasodilatation,[78] but the axon reflex has been further implicated in local vasodilating mechanisms. It is probably responsible for the reactive hyperemia in response to cold. Wybauw[79] has presented evidence of its activity not only in skin but also in muscle, where it may play a part in the spread of vasodilatation in the actively contracting muscle.

HORMONES

Much evidence has accumulated on the subject of the role of the autonomic nervous system in the genesis of ulceration in the gastrointestinal tract. Many authors have claimed that lesions of the hypothalamus may produce ulcers, while others have been unable to confirm this. It is certainly true that not every hypothalamic lesion is followed by an ulcer, but on the whole the incidence of ulceration following such lesions is higher than in non-operated animals, or in those in which lesions of other regions of the brain have been produced. Since such hypothalamic lesions, at least theoretically, produce changes in the local secretion of sympathin or acetylcholine, attempts have been made to induce ulcers by the administration of these substances. Necheles[80, 81] has now reported success using acetylcholine. Hemorrhagic ulcers were produced in all parts of the gastrointestinal tract in dogs by injections of this drug. Further implication of acetylcholine in the production of pathologic changes is claimed by Hall,[82] who has induced arteriosclerotic-like changes in the coronary arteries of dogs by repeated injections of this hormone.

What value these observations may have in regard to the genesis of ulcers and coronary disease in man is of course problematical. They serve, however, to bring again to the attention of physicians the importance of persistent imbalance of autonomic activity from reflex or psychic causes. It has been known for three quarters of a century that pronounced vagal reflexes affecting especially the heart may be obtained by irritation of the nasopharynx by vapors of ether, chloroform, ammonia, and so forth.[83] It is possible that irritation from tobacco smoke may also evoke these reflexes in susceptible subjects, and thus lead to excessive liberation of acetylcholine in the heart and gastrointestinal tract, where it may in time produce pathologic changes.[84]

Fisher, Ingram and Ranson[85] have recently summarized their studies of the nervous control of the secretion of the antidiuretic hormone. The hypophyseal hormone responsible for the prevention of diabetes insipidus is secreted by the pars nervosa, the median eminence and the infundibular stem. The secreting cells are themselves subject to nervous control from the supraoptic nuclei via the supraoptic hypophyseal tract, and an intact nervous mechanism is necessary for normal water metabolism. The presence of an intact anterior pituitary is necessary for the establishment of diabetes insipidus, or at least greatly facilitates its appearance, especially in the dog and cat. In the rat, presence of the anterior pituitary does not appear to be essential.

A definite spirit of progress is exhibited in a short explanatory note in a paper by Cannon and Lissak[86] entitled "Evidence for Adrenaline in Adrenergic Neurones." It marked the abandonment by

the Harvard physiologists of the term "adrenine" in favor of "adrenaline." The very sound reasons for using "adrenine" and the great authority of the Harvard school were never able to dislodge "adrenaline" from public favor, nor has the campaign in favor of "epinephrine" been any more successful. In taking this step Dr. Cannon has done much to encourage simplification of physiological nomenclature.

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MASSACHUSETTS MEDICAL SOCIETY

PROCEEDINGS OF THE COUNCIL

Annual Meeting, June 7, 1939

THE annual meeting of the Council of the Massachusetts Medical Society was held in the Municipal Memorial Auditorium, Worcester, on Wednesday, June 7. The President, Dr. Channing Frothingham, Suffolk, called the meeting to order at 10:30 o'clock. There were 219 councilors in attendance (Appendix No. 1).

The Secretary presented the record of the special meeting of the Council which was held in John Ware Hall, 8 Fenway, Boston, on Wednesday, April 26, 1939, as published in the *New England Journal of Medicine* for May 25, 1939. The record was declared approved.

One councilor having died since the last meeting, the President read the following obituary:

ALBERT F. LOWELL, M.D., of Gardner, died May 14, 1939, in his sixty-fifth year.

Born in Burlington, Vermont, Dr. Lowell received his degree from the University of Vermont College of Medicine in 1900 and had practiced in Gardner since 1901.

Dr. Lowell had been senior surgeon of the Henry Heywood Memorial Hospital and consulting surgeon at the State Hospital for the Insane at East Gardner, the Templeton Branch of the Walter E. Fernald School and the Peterboro (New Hampshire) Hospital.

His fellowships included the American Medical Association and the American College of Surgeons. He was a member of the Council of the Massachusetts Medical Society from June, 1923, until his death.

He is survived by his widow and one daughter.

The Council stood for a period of silence in respect to the memory of Dr. Lowell.

A roll call showed the following nominating councilors to be present: W. D. Kinney, Barnstable; W. H. Allen, Bristol North; E. F. Cody, Bristol South; F. W. Snow, Essex North; J. F. Jordan (alternate), Essex South; G. L. Schadt, Hampden; L. N. Durgin, Hampshire; R. R. Stratton, Middlesex East; C. M. Roughan, Middlesex North; A. W. Dudley, Middlesex South; W. A. Griffin, Norfolk; C. A. Sullivan, Norfolk South; W. H. Pulsifer, Plymouth; W. B. Breed, Suffolk; R. P. Watkins, Worcester; and C. B. Gay, Worcester North. (There were no representatives from the Berkshire and Franklin districts.) The nominating councilors retired to the Green Room for deliberation.

REPORTS OF STANDING COMMITTEES

Membership

The report (Appendix No. 2), which was presented by the chairman, Dr. H. Quimby Gallupe, Middlesex South, recommended that eleven fellows be allowed to retire, five allowed to have their dues remitted, four allowed to resign, three be deprived of the privileges of fellowship, four be restored to the privileges of fellowship, and four be allowed to change their districts without change of legal residence. The report was accepted by vote of the Council.

Financial Planning and Budget

The report (Appendix No. 3) was presented by the chairman, Dr. John Homans, Suffolk, and was duly accepted. The Council voted to approve the committee's recommendation that the annual salary of Mr. Robert St. B. Boyd be placed at $2500 per year.

Arrangements

Dr. Richard P. Stetson, Norfolk, chairman, presented the report (Appendix No. 4) of the committee, which was duly accepted by the Council.

Ethics and Discipline

The report (Appendix No. 5) was presented by the chairman, Dr. Robert L. DeNormandie, Suffolk, and was accepted by vote of the Council.

Medical Education and Medical Diplomas

Dr. Reginald Fitz, Suffolk, presented the report (Appendix No. 6), which was accepted by vote of the Council.

State and National Legislation

An informal report was presented by Dr. Charles C. Lund, Suffolk. He pointed out the need for constant vigilance in legislative matters and suggested the necessity of presenting a positive program. Certain nuisance bills can simply be opposed and defeated but, in the case of certain definite trends of public feeling, it is necessary for organized medicine to propose definite constructive legislation. If unfavorable bills along similar lines are to be successfully opposed, in his opinion the responsibility for the protection of the public in medical matters rests with the medical profession. He called attention to the legislative bulletin, copies of which had been distributed at the meeting.

He pointed out that the committee had been successful in defeating all the bills which it had opposed, with the exception of three which have not yet been disposed of. The same success was not obtained with the bills which the committee favored. Three relatively minor measures were passed and the bills signed by the Governor. One of these, proposed by Dr. Edward A. Knowlton, Hampden, has removed the restriction previously imposed relative to membership in this society by appointees to the Board of Registration in Medicine.

The bills for annual registration of physicians and the licensing of hospitals were defeated. The bill to make changes in the Nurses' Registration Act has not been acted on, and the outcome is by no means certain since serious objections have been raised to many of its provisions.

It was reported that the Committee on State and National Legislation, in co-operation with the Committee on Public Relations, acting under the instructions of the Council passed at the meeting of April 26, has submitted a bill to authorize the formation of a non-profit corporation to insure payments of physicians' bills. The proposed bill must first be passed by the rules committees of the Legislature and, if allowed by these committees, it will be scheduled for regular hearings and action in the usual way.

Dr. Lund then proceeded to discuss the action taken by the committee with reference to the Wagner Bill now before Congress. The chairman had been in communication with Senators Lodge and Walsh and was informed that the congressional subcommitteemen would hold hearings on certain dates in May. Senator Lodge advised that a representative of the Society should be present. Dr. Woodward, of the American Medical Association, gave similar advice. The chairman appeared before the subcommittee on May 26, 1939, after a series of conferences with representatives of the American Medical Association and with Senators Lodge and Walsh. His presentation to the committee differed somewhat from the arguments of the American Medical Association and at the end of the hearing the committee asked the Massachusetts Medical Society to assist in writing the proper kind of bill. The committee made a similar request to the American Medical Association.

He then proceeded to read a series of resolutions and referred to a statement by him which appeared in the *New England Journal of Medicine* for June 1, 1939, under "Legislative Notes."

The Council voted to accept the report as presented by the chairman. It then voted to approve the following resolutions:

> RESOLVED, That the President nominate and the Council of the Massachusetts Medical Society elect a special committee to study and to have corrected, so far as possible, the practice of medicine by unregistered persons.
>
> RESOLVED, That the Council of the Massachusetts Medical Society endorse the statement made by Dr. Charles C. Lund before the subcommittee of the United States Senate that is studying the Wagner Bill.

There was considerable discussion before the passage of the second resolution, part of which sought to delay action by the Council at this time and part of which was an explanation of the changes made in Dr. Lund's presentation between the time it was read to the Committee on State and National Legislation and the Committee on Public Relations in joint session and the final form in which it was read to the senatorial committee.

The Council then considered a third resolution submitted by Dr. Lund, which was as follows:

> RESOLVED, That the Council of the Massachusetts Medical Society urge the Trustees and the House of Delegates of the American Medical Association to prepare a bill or bills and have them introduced into Congress for the following purpose: to correct so far as medically and socially sound and possible of legislative correction the evils that the American Medical Association admits exist and which the proponents of the Wagner Bill have hoped to correct by their bill.

There appeared to be a feeling on the part of some councilors that action on this resolution should be postponed until a subsequent meeting of the Council so as to permit further discussion and

consultation with the American Medical Association.

An amendment was proposed by Dr. Michael A. Tighe, Middlesex North, which would refer the whole matter of the Wagner Bill to a special committee which would report at the February meeting of the Council and that subsequently the findings would be referred to the House of Delegates of the American Medical Association. Dr. Lund pointed out the danger of delay and quoted from a telegram received by him from Senator Lodge. Dr. Tighe's amendment was put to vote and was lost.

Dr. Lund's original resolution was then presented and was approved by the Council.

Public Health

The report (Appendix No. 7) of the committee, prepared by the chairman, Dr. Robert B. Osgood, Suffolk, was presented by Dr. Francis P. Denny, Norfolk. The report was accepted. After some discussion of a proposal that the Massachusetts Medical Society assist in conducting medical examinations of young people under the National Youth Administration, the Council voted to decline the invitation.

Others

There were no reports from the Committee on Publications, the Committee on Medical Defense and the Committee on Permanent Home.

REPORTS OF SPECIAL COMMITTEES

Cancer

There was no report from this committee.

Postgraduate Instruction

The report (Appendix No. 8) was presented by Dr. Reginald Fitz, Suffolk. It was accepted, and the Council voted to approve the recommendation that the Committee on Postgraduate Instruction be continued.

Physical Therapy

Dr. Franklin P. Lowry, Middlesex South, presented the report (Appendix No. 9) of this committee, which was accepted by vote of the Council.

Public Relations

Dr. Elmer S. Bagnall, Essex North, stated that the report made by Dr. Lund concerning the proposed legislation to insure payment of physicians' bills and his report on the Wagner Bill covered the activities of the Committee on Public Relations since its previous report.

Industrial Health

The President stated that this was a new committee appointed at the request of the American Medical Association. No report was presented.

Relations Between Physicians, Hospitals and Insurance Companies

In the absence of the chairman, Dr. William G. Curtis, Norfolk South, Dr. Henry M. Landesman, Norfolk, the secretary, informally reported that four cases had been adjusted for physicians during the past year and that two others are in process. Apparently all parties concerned are satisfied with the workings of the agreement. He stated that the insurance companies are of the opinion that many physicians have not yet taken advantage of the authorization forms and consequently fail to obtain protection of their accounts in accident work. The report was accepted.

Restoration to Fellowship

The Council voted to approve of the reports of committees recommending restoration to the privileges of fellowship of seven applicants and to accept the report of a committee which did not recommend restoration of one (Appendix No. 10).

The Council voted to appoint committees to consider petitions for restoration to fellowship received from six individuals (Appendix No. 11).

REPORT OF NOMINATING COMMITTEE

Dr. Edmond F. Cody, Bristol South, presented the report of the Nominating Committee which recommended election to office for the ensuing year of the following:

For president: Walter G. Phippen, Salem.
For vice-president: A. Warren Stearns, Billerica.
For secretary: Alexander S. Begg, West Roxbury.
For treasurer: Charles S. Butler, Boston.
For orator: W. Jason Mixter, Boston.

There being no nominations from the floor, it was voted that the nominations cease and that the Secretary be instructed to cast one ballot for the individuals named by the Nominating Committee. The Secretary reported that the ballot had been cast and the President declared the gentlemen named to be duly elected.

APPOINTMENTS OF COMMITTEES

The President proceeded to nominate and the Council to elect the members of the standing and special committees. (The list will be published with the proceedings of the Society in the July 6 issue of the *Journal*.)

As members of the Committee on State and

National Legislation, the President nominated Drs. Charles C. Lund, Earle M. Chapman, Charles A. Robinson, William A. R. Chapin and John A. McLean. Dr. Roger I. Lee, Suffolk, moved the nomination of Drs. Brainard F. Conley and David L. Lionberger. There being seven nominations, ballots were issued, and the President appointed Drs. Lee, Homans, Shattuck and Blaisdell as tellers. The names of the nominees were written on the blackboard for consideration by the Council. After some discussion as to procedure, it was finally voted that the five men receiving the highest vote would be considered elected. It was voted that nominations cease, and the Council proceeded to ballot. The tellers retired to count the vote.

In connection with the retirement of Dr. Franklin G. Balch, Norfolk, as chairman of the Committee on Medical Defense and of Dr. Robert B. Osgood, Suffolk, as chairman of the Committee on Public Health, the Council voted to extend its thanks and appreciation to these gentlemen for their faithful services.

It was voted that the incoming president should nominate a fifth member of the Committee on Financial Planning and Budget since he is now a member of that committee and his election as president makes him a member ex-officio, thus creating a vacancy.

PROPOSED CHANGES IN THE BY-LAWS

The Council voted to approve certain amendments to the by-laws and to recommend their adoption by the Society at its annual meeting on June 8. (The complete text of these amendments will appear with the proceedings of the Society in the July 6 issue of the *Journal*.)

In the discussion of the individual amendments, the Council voted to transpose one sentence in Amendment No. 3 so as to avoid ambiguity. The Council voted not to approve of the proposed amendments which would change the time of appointment of the standing committees from June to October. There was some discussion about the length of time which fellows serve on committees. It was pointed out that the Committee of Arrangements has one new member appointed each year and the senior member retires. Dr. Fitz stated that the Committee on Medical Education and Medical Diplomas is of the opinion that rotation is desirable.

INCIDENTAL BUSINESS

The appointment of twenty-five fellows to serve as voting members in the Associated Hospital Service Corporation of Massachusetts was confirmed by the Council. (The complete list will appear as a part of the proceedings of the Society in the issue of July 6.)

The Council voted to confirm the appointments of three delegates and one alternate to the Convention for the Revision of the *Pharmacopoeia of the United States*, which will meet in Washington, District of Columbia, on May 14, 1940, as follows:

DELEGATES

Soma Weiss, Boston
James H. Means, Boston
Harold J. Jeghers, Brighton

ALTERNATE

William B. Castle, Boston

The President presented a letter from the Bureau of Legal Medicine and Legislation of the American Medical Association asking the Massachusetts Medical Society, at its annual session in Worcester, to voice a strong demand for an appropriation for the construction of a new building for the Army Medical Library and Museum in Washington, District of Columbia, and to appoint a committee to follow this matter through until an appropriation has been made.

Dr. Shields Warren, Suffolk, discussed the importance of the suggestion made and emphasized the need of new quarters for the Army Medical Museum and Library since the collections contained therein are of such value to all types of medical research. He moved that the Council take the action requested. The motion was duly passed.

Dr. Robert L. DeNormandie, Suffolk, presented a communication (Appendix No. 12) from the Advisory Committee of the Section of Obstetrics and Gynecology. On motion of Dr. DeNormandie, it was voted that the President appoint a committee of five to study the question of expert testimony in court cases and that it be empowered to confer with the Massachusetts Bar Association with the hope that rules and regulations may be drawn up in order to improve the situation.

Dr. John M. Fallon, Worcester, read a statement (Appendix No. 13) concerning the progress which is being made in the negotiations between hospital authorities and certain groups of specialists in the medical profession.

Dr. Henry M. Landesman, Norfolk, presented a communication to the Secretary enclosing a proposal for the organization of an insurance plan. The chair announced that this would be referred to the Committee on Public Relations for study.

The Council recessed for the Cotting Luncheon from 1:20 to 2:30 p. m. On resuming the session the President announced that the only remaining item of business was to receive the report of the tellers appointed to count the ballots for the nomination of members to the Committee on State and National Legislation.

Dr. Homans announced that the following fellows had been chosen:

Charles C. Lund
Earle M. Chapman
David L. Lionberger
Charles A. Robinson
Brainard F. Conley

The President then announced that he nominated Dr. Charles C. Lund as chairman of the committee. There being no other nominations, the Council voted to approve of Dr. Lund's appointment as chairman.

The meeting adjourned at 2:35 p. m.

ALEXANDER S. BEGG, *Secretary.*

APPENDIX NO. 1

ATTENDANCE

BARNSTABLE
M. E. Champion
W. D. Kinney

BERKSHIRE
J. J. Boland
I. S. F. Dodd
C. F. Fasce
John Hughes
C. F. Kernan

BRISTOL NORTH
R. M. Chambers
W. H. Allen
F. H. Dunbar
W. H. Swift

BRISTOL SOUTH
Thomas Almy
R. B. Butler
E. F. Cody
J. A. Fournier
E. D. Gardner
I. N. Tilden

ESSEX NORTH
H. F. Dearborn
E. S. Bagnall
C. S. Benson
E. H. Ganley
H. R. Kurth
P. J. Look
G. L. Richardson
F. W. Snow
L. T. Stokes
C. A. Weiss

ESSEX SOUTH
H. A. Boyle
J. F. Donaldson
R. E. Foss
S. E. Golden
J. F. Jordan

FRANKLIN
F. J. Barnard
W. J. Pelletier
H. G. Stetson

HAMPDEN
Frederic Hagler
T. S. Bacon
E. P. Bagg
W. C. Barnes
J. M. Birnie
W. A. R. Chapin
J. L. Chereskin
E. C. Dubois
G. L. Gabler
M. F. Gaynor
P. E. Gear
G. D. Henderson
E. A. Knowlton
M. W. Pearson
A. G. Rice
G. L. Schadt
H. L. Smith
G. L. Steele

HAMPSHIRE
A. J. Bonneville
J. D. Collins
L. N. Durgin

MIDDLESEX EAST
J. H. Blaisdell
Richard Dutton
E. M. Halligan
J. H. Kerrigan
K. L. Maclachlan
R. W. Sheehy
R. R. Stratton

MIDDLESEX NORTH
F. L. Gage
A. R. Gardner
E. A. Payne
C. M. Roughan
A. W. Stearns
M. A. Tighe

MIDDLESEX SOUTH
E. W. Barron
Harris Bass
E. H. Bigelow
G. F. H. Bowers
E. J. Butler
B. F. Conley
C. L. Derick
J. E. Dodd
D. C. Dow
A. W. Dudley
H. Q. Gallupe
F. W. Gay
H. G. Giddings
H. W. Godfrey
W. G. Grandison
A. D. Guthrie
A. M. Jackson
A. A. Levi
F. P. Lowry
R. A. McCarty
J. A. McLean
Edward Mellus
J. C. Merriam
C. E. Mongan
J. P. Nelligan
E. J. O'Brien, Jr.
W. D. Reid
Max Ritvo
E. S. A. Robinson
E. F. Ryan
E. J. Sawyer
W. N. Secord
E. F. Sewall
H. P. Stevens
H. W. Thayer
Fresenius Van Nüys
R. H. Wells
M. W. White
W. S. Whittemore

NORFOLK
C. J. Kickham
J. D. Adams
F. J. Bailey
F. G. Balch
J. R. Barry
A. S. Begg
M. I. Berman
G. F. Blood
Myrtelle M. Canavan
William Dameshek
G. L. Doherty
Albert Ehrenfried
D. G. Eldridge
C. B. Faunce, Jr.
J. C. V. Fisher
Eli Friedman
Maurice Gerstein
W. A. Griffin
J. B. Hall
I. R. Jankelson
C. J. E. Kickham
E. L. Kickham
H. M. Landesman
W. A. Lane
D. L. Lionberger
F. P. McCarthy
M. W. O'Connell
Frederick Reis
D. D. Scannell
J. W. Spellman
R. P. Stetson
H. F. R. Watts

NORFOLK SOUTH
D. B. Reardon
C. S. Adams
R. L. Cook
W. G. Curtis
N. R. Pillsbury
W. L. Sargent
C. A. Sullivan

PLYMOUTH
J. E. Brady
Jacob Brenner
H. A. Chase
A. L. Duncombe
P. B. Kelly
P. H. Leavitt
D. W. Pope
W. H. Pulsifer
H. C. Reed

SUFFOLK
Reginald Fitz
W. B. Breed
W. J. Brickley
C. S. Butler
E. M. Chapman
David Cheever
M. H. Clifford
H. M. Clute
Lincoln Davis
R. L. DeNormandie
N. W. Faxon
G. B. Fenwick
A. McK. Fraser
Channing Frothingham
M. N. Fulton
Joseph Garland
John Homans
A. A. Hornor
Rudolph Jacoby
E. P. Joslin
H. A. Kelly
T. H. Lanman
R. I. Lee
C. C. Lund
J. P. Monks
R. N. Nye
L. E. Phaneuf
Helen S. Pittman
W. H. Robey
G. C. Shattuck
R. M. Smith
S. N. Vose
Shields Warren
Conrad Wesselhoeft

WORCESTER
J. C. Austin
Gordon Berry

W. P. Bowers
L. R. Bragg
W. A. Bryan
P. H. Cook
W. J. Delahanty
G. A. Dix
E. B. Emerson
G. E. Emery
J. M. Fallon
E. L. Hunt
E. R. Leib
W. F. Lynch
A. W. Marsh
J. W. O'Connor
W. C. Seelye
C. A. Sparrow
G. C. Tully
R. J. Ward
F. H. Washburn
R. P. Watkins
S. B. Woodward

Worcester North

E. A. Adams
W. E. Currier
T. R. Donovan
C. B. Gay
J. C. Hales
H. R. Nye

APPENDIX NO. 2

Report of the Committee on Membership

This committee recommends:

1. That the following named eleven fellows be allowed to retire under the provisions of Chapter I, Section 5, of the by-laws:

Ahearne, Cornelius A., Jr., Salem, with remission of dues for 1939
Brunelle, Pierre, Lowell
Craigin, George A., Boston
Cusick, Thomas F., Taunton, with remission of dues for 1936, 1937, 1938 and 1939
Davis, Minot F., Boston, with remission of dues for 1936, 1937, 1938 and 1939
Galvin, William, North Adams, with remission of dues for 1939
Howard, Charles T., Boston, with remission of dues for 1936, 1937, 1938 and 1939
Milliken, Charles W., Fairhaven, with remission of dues for 1939
Sullivan, John T., Dorchester, with remission of dues for 1939
Wilcox, DeWitt G., Newton Centre
Young, Roy D., Arlington, with remission of dues for 1936, 1937, 1938 and 1939

2. That the dues of the following named five fellows be remitted under the provisions of Chapter I, Section 6, of the by-laws:

Borden, Charles R. C., Brookline, 1939
Dunscombe, William C., Porto Rico, 1939
Hamilton, Robert D., Newburyport, 1939
Plouffe, Bernard L., Webster, 1938 and 1939
Wilder, Edward W., South India, 1939

3. That the following named three fellows be allowed to resign under the provisions of Chapter I, Section 7, of the by-laws:

MacMillan, Andrew Louis, Jr., Concord, New Hampshire, with remission of dues for 1939
McLean, Emory A., Portland, Maine, with remission of dues for 1939
Pagliuca, Frank A., Boston, with remission of dues for 1937, 1938 and 1939

4. That the following named fellow be allowed to resign under the provisions of Chapter VII, Section 4, of the by-laws:

Pearlstein, Max, Braintree

5. That the following named three fellows be deprived of the privileges of fellowship under the provisions of Chapter I, Section 8, Clause *a* of the by-laws:

Annis, Sumner B., Maynard
Karlsberg, Irving J., Hudson
Lyle, Eveline B., Brookline

6. That the following named four fellows be restored to the privileges of fellowship:

Costa, Domizio A., Revere
Mahony, Francis R., Lowell
McCarthy, Humphrey L., Boston
Rushmore, Stephen, Newton Centre

7. That the following named four fellows be allowed to change their membership from one district society to another without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws:

From Middlesex South to Suffolk

Burrage, Walter S., Newton

From Norfolk to Suffolk

Beaman, George B., Jr., Wellesley Hills
Hoyt, Lyman H., Brookline
Woodall, J. Martin, Jamaica Plain

APPENDIX NO. 3

Report of the Committee on Financial Planning and Budget

The Committee on Financial Planning and Budget makes the following recommendations to the Council:

1. In the matter of an honorarium for the orator of the Society at the annual meeting, referred to the Committee on Financial Planning and Budget by the Council: the committee recommends that it is not advisable to offer the orator of the Society an honorarium on account of his oration at the annual meeting.

2. The committee recommends to the Council that the annual salary of Mr. Robert St. B. Boyd, originally $2000, be raised during the present year to $2500, that is, to $500 more than was appropriated at the February meeting of the Council.

John Homans, *Chairman.*

APPENDIX NO. 4

Report of the Committee of Arrangements

The Committee of Arrangements takes this opportunity to present before the Council the tremendous importance of the work of Mr. Robert Boyd in the planning and execution of the activities associated with the annual meeting. His energy, meticulous attention to detail and cheerful and diplomatic dealings with the many individuals and groups concerned with the annual meeting make his services to the Society of inestimable value.

It is of material interest to report that the revenue from commercial exhibits at the Worcester meeting in 1934 was approximately two thousand dollars, whereas it will probably be more than forty-eight hundred dollars this year.

The Committee of Arrangements takes pleasure in expressing to Dr. Charles A. Sparrow and to his associates on the Worcester Committee for the Annual Meeting its

appreciation for the careful planning and enthusiastic work carried on by this group. To the initiative and co-operation of the Worcester committee is due the success of this meeting, and to them the Society owes its gratitude.

RICHARD P. STETSON, *Chairman.*

APPENDIX NO. 5

REPORT OF THE COMMITTEE ON ETHICS AND DISCIPLINE

Since our report to you at the February meeting of the Council, we have held two prolonged meetings.

We have given hearings to two fellows. The first was to a fellow who admitted paying the sum of $200 to a selectman of a town in order to become the town physician. After hearing his story of the transaction, we asked him for his resignation from the Society, and he at once sent it in to the Secretary.

The second hearing was on charges of unprofessional conduct brought by a layman against a fellow. The layman consulted the fellow with the primary object of the termination of his wife's pregnancy because of her disturbed nervous and mental condition. The fellow sent the patient into a hospital, opened the abdomen, tied off the tubes and removed the appendix when she was between three and four months pregnant. He did not explain to the husband or wife that he had failed to terminate the pregnancy until after the patient suspected that she was still pregnant and the husband called up the fellow and asked him. The committee unanimously (the President of the Society sitting with us) agreed that the fellow's conduct was not ethical, and voted that the President send to him a letter of severe admonition. This has been done.

We have also considered twelve requests for information or complaints of unprofessional conduct of fellows. These have all been carefully considered at the meetings. The requests for information have been answered and the complaints against fellows have been adjusted.

ROBERT L. DENORMANDIE, *Chairman.*

APPENDIX NO. 6

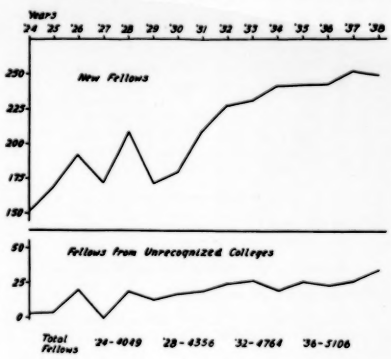
REPORT OF THE COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

During the past year this committee has held three meetings, has personally interviewed 80 applicants from schools unrecognized by the Council, and of these has acknowledged the diplomas of 50.

How to evaluate such diplomas continues to be the committee's most difficult task. Each applicant who presents his credentials almost invariably is able to produce several laudatory recommendations from a number of fellows. Many such letters are obviously solicited, are by no means confidential, and are not written according to the spirit of our by-laws.

By asking for information regarding the abilities and reputation of each candidate from his district secretary just before the meeting of the censors and after the list of names of new applicants has been published in the *Journal*, we are able to obtain a few strictly confidential letters concerning applicants, and these are likely to prove informative. At best, however, the manner in which new fellows who are graduated from foreign or unrecognized American schools are elected to the Society is unsatisfactory.

During the past fifteen years there has been a distinct change in character of our fellowship. This is well illustrated by the accompanying graph. The Society grows



steadily in size and importance. It is evident that an increasing number of fellows who are graduates from foreign or domestic schools that we do not recognize are entering the Society each year. Two divergent views on this matter are held by the fellows of the Society in different parts of the State. There are certain fellows who believe that membership in the Society should be open to almost all physicians who are licensed to practice medicine according to the laws of the Commonwealth, and that no strong barriers should be built up to exclude any doctor with sufficient knowledge to pass our state-board examinations. At the other extreme are those who believe that membership in the Society should be strictly limited, and who criticize the work of our committee, saying that already we recognize too many diplomas each year and that we should be more critical.

To the committee the solution of the problem appears to lie entirely in the hands of the district societies. Unless fellows will give the committee confidential information proving the unfitness of any given candidate, we are compelled to accept as honest documents such letters of commendation as are sent in, and if, as of late has happened regularly, the latter far outnumber the former, we are led to assume that the majority of fellows are indifferent or actually favor an enlarged membership made up of an increasing proportion of men of uncertain educational background.

Another problem has recently arisen. This concerns the manner in which physicians who are graduates of foreign schools should be treated by the Society. Lately there have emigrated to Massachusetts from abroad, a number of mature, admirably trained, foreign doctors. They are entirely different from those younger men, unable to get into a reputable domestic school, who have gone abroad and have returned home again with a medical diploma of uncertain usefulness. How should these distinguished older men be treated? Should they at once be welcomed by the Society and admitted to its membership with all privileges or is it better judgment to accept them slowly? The committee has adopted the latter policy and for so doing has received harsh criticism from various quarters. We should welcome discussion on this point so that we may know how the Society as a whole feels about it.

During the past year the committee has watched with interest the progress of the Society's efforts at postgraduate education. The program has created favorable discussion in other parts of the country and, on the whole, has proved successful. This year the Suffolk District Medical Society tried a new experiment. Each doctor licensed to practice and having an office in Suffolk County was invited to attend the course of lectures and those who expressed the desire were sent each week a postcard stating the subject of the week's lecture, the lecturer, and the time and place at which the lecture would be given. In this manner many doctors not hitherto approached by the Society were given opportunity and stimulus to receive systematic postgraduate instruction. Nearly two hundred attended the more popular sessions.

Another new effort in education sponsored by the Society in the past year was the Postgraduate Assembly. This proved unexpectedly popular and no doubt will become increasingly so as time goes on. The Society is to be congratulated on having initiated so useful an undertaking.

EDWARD S. CALDERWOOD,
ARCHIBALD R. GARDNER,
GEORGE D. HENDERSON,
A. WARREN STEARNS,
REGINALD FITZ, *Chairman.*

APPENDIX NO. 7

REPORT OF THE COMMITTEE ON PUBLIC HEALTH AND THE SUBCOMMITTEE ON PUBLIC EDUCATION

The Committee on Public Health and the Subcommittee on Public Education beg leave to submit the following report:

The radio broadcasts under the auspices of the Massachusetts Department of Public Health and the Massachusetts Medical Society will continue each week into July. It is unfortunate that, owing chiefly to the popularity of the great American game of baseball, Station WAAB has twice felt it necessary to change the time of their delivery. Fan mail in satisfactory amount continues to be received.

The committee has been asked by the Public Health Committee of the Massachusetts Federation of Women's Clubs to provide speakers for several local group meetings of the Federation and to prepare several short articles for publication in its magazine on various medical topics suggested by the Federation. Thanks to the *pro bono publico* attitude of the members of the Massachusetts Medical Society, these requests have been satisfactorily met.

The committee has also arranged, at the request of the Federation, speakers for three broadcasts sponsored by it and dealing with the present medical situation. The first of these was on the subject of "The Value of Organized Medicine to the People of the Commonwealth" by Dr. Dwight L. Siscoe; the second on "The Dangers of Socialized Medicine" by Dr. Elmer S. Bagnall; and the third on "Adequate Medical Care for the Indigent and Medically Needy" by Dr. Allan M. Butler. The Committee on Public Health believes that the friendly co-operation with this large well-organized group of women is desirable and advantageous to both the Federation and the Massachusetts Medical Society.

The Committee on Public Health held a meeting on April 25. At the meeting the thoughtful and laboriously prepared report of the Committee on Public Relations was considered. It was the unanimous opinion of the members of the Committee on Public Health that the Massachusetts Medical Society should go on record as favoring the attempt to make available to the indigent and low-income groups some form of voluntary non-profit insurance for the payment of medical services of physicians. It was also the unanimous opinion of the committee that the first step should be to secure the passage at the present session of the Legislature of an enabling act to make possible the submission of some plan approved by the Massachusetts Medical Society for such insurance. The committee believes that it is of extreme importance that the Massachusetts Medical Society should have a strong if not the controlling voice in working out any plans for voluntary non-profit insurance of this nature.

The Committee on Public Health at its last meeting held on May 29 voted to recommend the sponsoring of broadcasts during the coming year, under the heading of "Green Lights to Health," if possible with the co-operation of the Massachusetts Department of Public Health. It seems to the committee that larger audiences are obtained under this system than by any other method at present available.

Dr. Jakmauh, the health commissioner, has requested the Massachusetts Medical Society to arrange if possible for the examination of the young men and women in the Massachusetts branches of the National Youth Administration. The committee has had some communication with the commissioner's office, and I shall read a letter which has just come from Dr. Alton S. Pope, deputy commissioner of public health, written at the request of Dr. Jakmauh. (Dr. Denny read the letter.) You will see that this requires the careful medical examination of some 3000 young men and women ranging in age from eighteen to twenty-five. There would probably be various areas which would serve as headquarters—perhaps Boston, Worcester, Springfield and Pittsfield. They have asked the Massachusetts Medical Society to advise as to the type of examination and to estimate the cost of such care. The Committee on Public Health would like the opinion of the Council as to whether it is in sympathy with providing such services for the National Youth Administration under the auspices of the Massachusetts Medical Society, and if so, would it be willing to grant the committee authority to arrange for such examinations, in co-operation with the Department of Public Health, in the different areas by members of the Society living in the neighborhood, provided the remuneration for such examinations would be reasonably satisfactory. No figures as to remuneration have been given, although at the administration centers throughout the country a physician is employed on a part-time basis and receives reasonable compensation for this service according to the amount of work performed in the way of medical care. We are asked only to provide for medical examinations, I gather, on the same sliding scale according to the extent and number of the examinations. The committee believes it is extremely important that such examinations should not be made unless facilities can be arranged for careful examinations.

ROBERT B. OSGOOD, *Chairman,*
GERALD N. HOEFFEL, *Secretary.*

APPENDIX NO. 8

REPORT OF THE COMMITTEE ON POSTGRADUATE INSTRUCTION

The postgraduate extension courses for the academic year 1938-1939 ended on May 4; this completes the second year of co-operation with the Massachusetts Department

of Public Health, the United States Public Health Service and the Federal Children's Bureau in giving such courses. The total enrollment for the past year was 795. Details of attendance are shown in the attached table of statistics.

Clinical teaching in syphilis and gonorrhea has been established, under joint auspices of the Society and the government agencies, at the Massachusetts General Hospital and the Boston Dispensary. These clinics have been successful; it is planned to continue this teaching next year. A statistical report of these clinics is attached.

In accordance with the vote of the Council, at its meeting on February 1, 1939, the committee will prepare an outline of courses, in co-operation with the government agencies, and report concerning financial arrangements at the next Council meeting.

The committee wishes to report splendid co-operation from the members of the faculty who have carried on their teaching duties at a high level of efficiency. The committee wishes to express the thanks of the Society to them for their very splendid assistance.

The second annual New England Postgraduate Assembly will be presented on October 31 and November 1, 1939. So far, all the New England state medical societies, except that of Connecticut, have joined with our society in sponsoring this assembly. The program is almost completed; a list of prominent speakers from various parts of this country and abroad have been invited as guest speakers. Sir Thomas Lewis, of England, has already accepted our invitation to appear on the program. Programs will be mailed to all physicians in New England in the autumn.

It is recommended that the Committee on Postgraduate Instruction be continued.

FRANK R. OBER, *Chairman,*
LEROY E. PARKINS, *Secretary.*

ATTENDANCE — POSTGRADUATE EXTENSION COURSES

DISTRICT	PLACE	1936	1937	1938	1939
Barnstable	Hyannis	29	21	22	33
Berkshire	Pittsfield	44	41	55	45
Bristol North	Taunton	16	24	27	31
Bristol South	Fall River	14	21	20	36
	New Bedford	40	45	38	34
Essex North	Lawrence	22	—	31	48
Essex South	Salem	66	62	58	54
Franklin	Greenfield	20	29	28	27
Hampden	Holyoke	26	32	33	30
	Springfield	50	32	50	40
Hampshire	Northampton	32	29	32	30
Middlesex East	Melrose	14	13	42	21
Middlesex North	Lowell	30	37	32	21
Middlesex South	Cambridge	71	43	80	50
Norfolk	Norwood	29	13	24	—
Norfolk South	Quincy	21	12	30	25
Plymouth	Brockton	27	20	37	35
Suffolk	Boston	—	—	—	180
Worcester	Milford	24	26	23	20
Worcester North	Fitchburg	23	24	46	35
Totals		598	524	708	795

TEACHING CLINICS IN GONORRHEA AND SYPHILIS

Gonorrhea — Boston Dispensary	November 1, 1938 – April 27, 1939 Clinics: 49 Attendance: 24 physicians Clinic visits: 127
Syphilis — Massachusetts General Hospital	November 1, 1938 – April 27, 1939 Clinics: 49 Attendance: 18 physicians Clinic visits: 135

APPENDIX NO. 9

REPORT OF THE COMMITTEE ON PHYSICAL THERAPY

Until the last few years, there has been very little well-directed education in physical therapy. For that reason, the great majority of physicians now in active practice have had little opportunity to appreciate the value of this branch of medicine. Early instruction in physical therapy was provided almost entirely by the manufacturers of apparatus for use in this field. Little criticism, however, can be accorded their work, undesirable as much of it was, for not until comparatively recently have any of our medical schools provided instruction in physical therapy — and some have not yet done so. Appropriate educational procedures can give the prospective physician at least an opportunity to realize something of the possibilities and limitations of physical therapy.

Many physicians seldom use the simpler forms of physical therapy which can be of definite value to patients, and very few have sufficient knowledge to use, wisely, complicated apparatus for this purpose.

To cope with these conditions, the American Medical Association and this society have attempted to provide assistance. During the past year, this committee has supplied speakers for medical meetings and has prepared and published with your approval a pamphlet to help acquaint physicians and medical students with this subject. A cinema has just been completed depicting the actual use of various types of simple and more complex forms of treatment in this field. Application for the showing of this cinema may be made to the chairman of this committee.

The committee earnestly requests members of the Massachusetts Medical Society to acquaint themselves with at least the simpler aspects of physical therapy and to disseminate information concerning this much neglected branch of medicine.

FRANKLIN P. LOWRY, *Chairman,*
GEORGE R. MINOT,
ROBERT B. OSGOOD.

APPENDIX NO. 10

REPORT OF COMMITTEE APPOINTED TO CONSIDER RESTORATION TO FELLOWSHIP

Restoration to fellowship was recommended for the following seven former members:

E. Olin Angell, Millbury (Committee: Charles N. Church, William B. Clapp and Arthur A. Brown).

Parker M. Cort, Springfield (Committee: Allen G. Rice, John M. Birnie and George L. Steele).

Israel Kaplan, Salem (Committee: J. Frank Donaldson, Leonard F. Box and Arthur W. O'Neil).

Edward Lopatin, Worcester (Committee: Charles A. Sparrow, George C. Tully and Erwin C. Miller).

John T. H. Powers, Greenfield (Committee: Lawrence R. Dame, Howard M. Kemp and Harry N. Howe).

Lewis Siegel, Somerville (Committee: John A. McLean, Edmund H. Robbins and Edward J. Dailey).

Arthur J. Taveira, New Bedford (Committee: Thomas B. Horan, Carl C. Persons and Wilfred J. Rousseau).

Restoration to fellowship was not recommended for the following former member:

Horace G. MacKerrow, Worcester (Committee: Allen G. Rice, Arthur W. Marsh, Edwin R. Leib and Roy J. Ward).

APPENDIX NO. 11

Committees Appointed to Consider Petitions for Restoration to Fellowship

The following committees were appointed to consider the petitions for restoration to fellowship of the following six former members:

For David Barron, Brockton:
Alfred L. Duncombe, Harrison A. Chase and Frederick F. Weiner.

For Gerard Cote, Salem:
Charles L. Curtis, Horace Poirier and John G. Adams.

For Irving L. Kushner, Somerville:
Edmund H. Robbins, Charles H. Dalton and Louis J. Grandison.

For John F. O'Brien, Fall River:
Edward L. Merritt, George C. King and Emery C. Kellogg.

For Hyman S. Queen, Brookline:
Frank S. Cruickshank, Charles J. Kickham and Frederick Reis.

For Harold S. Tait, Palmer:
Morgan B. Hodskins, Sidney R. Carsley and Lucy G. Forrer.

APPENDIX NO. 12

Resolution from the Advisory Committee of the Section of Obstetrics and Gynecology

The Advisory Committee of the Section of Obstetrics and Gynecology of the Massachusetts Medical Society has at various times talked over the question of expert witnesses in court cases. It is realized that at times the testimony given has been at variance with the best medical knowledge. It suggests that a committee of five be appointed by the President to study this whole problem. It further suggests that this committee appoint a group sufficiently large to cover all the specialties, from which expert witnesses may be chosen to give testimony. It is suggested that these experts serve without remuneration, or if remuneration is received that it revert to the Society. It therefore wishes to present to the Council the following resolution:

Be It Resolved That, The President appoint a committee of five to study the question of expert testimony in court cases and to confer with the Massachusetts Bar Association with the hope that rules and regulations may be drawn up in order to improve the situation.

Roy J. Heffernan, *Chairman*,
Raymond S. Titus, *Secretary*.

APPENDIX NO. 13

Statement from Dr. John M. Fallon

As the Council knows, there has been debate for three years about the status of the anesthetists in hospital prepayment plans. The situation has been talked over several times in the Council, and the Committee on Public Relations was asked to investigate. This committee appointed a subcommittee consisting of Drs. Dunbar, Blaisdell and Tighe. The subcommittee arranged a conference between representatives of the hospital administrators and the anesthetists to meet and settle on a mutually agreeable formula. This formula was finally arrived at last night by representatives of the New England Society of Anesthesiology and Dr. Eugene Walker, of the Springfield Hospital, and Mr. Frank Wing, of the Boston Dispensary, representing the Massachusetts Hospital Association and the Boston Hospital Council respectively.

These representatives, after discussion and rejection of a plan to pay the hospitals $5.00 for each anesthesia given by a hospital employee, came to unanimous agreement on the following formula offered by the New England Society of Anesthesiology:

> We are opposed to the inclusion of anesthetists' services under the benefits to be derived under hospital prepayment contracts, and further, opposed to the inclusion of the word anesthesia in the contract, inasmuch as anesthesia is a medical service. We recommend that hospitals which furnish anesthesia bill patients separately for anesthesia as for other extras.

These representatives of the hospital and anesthetists' groups will report to their respective organizations, and intend to present a plan for definite action at the next Council meeting.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 25261

PRESENTATION OF CASE

A twenty-two-year-old single woman was admitted for study.

At the age of fourteen years the patient gradually developed pain in the left mid-thigh. Two months later she began to limp. A year later she entered an outside hospital where a diagnosis of cyst of the neck of the left femur was made. At this time she weighed 71 pounds and was 53 inches tall. A tumor-like mass was also noted in the left maxilla just above the second bicuspid and first molar teeth. The cyst of the femur was curetted. During the next three years she used crutches. She became quite thin. During the fifth year before admission she was operated on twice, once for the removal of a cyst of the jaw and five teeth, and another time for a cyst in the lower third of the right femur. Blood studies at that time showed the calcium to be 14.3 mg. per 100 cc., the phosphorus 2.6 mg., and the serum protein 6.3 gm.

X-ray films showed cyst formation and decalcification of nearly all the bones in the body. No renal calculi were seen. A neck exploration was then done. This showed no lesion on the right side, but a nodule was found on the left which microscopically was said to exhibit "adenomatous hyperplasia" of a parathyroid. Two weeks postoperatively the serum calcium was 16.8 mg. and the phosphorus 2.4 mg. per 100 cc. X-ray therapy was then begun over the right and left cervical regions, including the upper two thirds of the chest. A total of 8712 r was given over a period of many months. Blood serum studies at monthly intervals showed that the calcium varied between 10.8 and 14.3 mg. per 100 cc., the phosphorus between 1.1 and 1.7 mg., the protein between 6.0 and 7.4 gm., and the phosphatase between 24.5 and 33.9 Bodansky units. X-ray therapy was discontinued the next year. Following this the serum calcium ranged from 11.6 to 14.2 mg. per 100 cc., the phosphorus from 1.6 to 4.3 mg., the protein from 6.8 to 7.8 gm., and the phosphatase from 18.4 to 73.6 units. Three years before admission a second neck exploration was done. At this time the pretracheal muscles were sectioned and the thyroid was completely exposed on both sides. A large area extending from above the thyroid cartilage down into the substernal space was explored and both sides examined thoroughly by direct vision and palpation. No evidence of gland enlargement or suspicious tissue could be found. During the next two years she suffered from no significant symptoms. Her serum calcium and phosphorus levels remained essentially unchanged. Eight months before entry a cyst developed in the right maxilla and gradually increased in size. Six months later x-ray films showed a tumor in the region of the right antrum but no bone destruction. The basal metabolic rate was +10 per cent. The serum calcium was 15.2 mg. per 100 cc., the phosphorus 2.5 mg., the protein 6.4 gm., and the phosphatase 26.3 units. A Mosenthal test showed the urinary specific gravity to vary from 1.009 to 1.014. She entered this hospital for further study.

Physical examination showed a puerile but well-proportioned girl weighing 85 pounds, and measuring 59 inches in height. There was a large cyst in the right maxilla which appeared to extend into the right antrum. The thyroid gland was not palpable and there were no nodules in the neck. There were a few light-brown pigmented areas over the chest and abdomen measuring up to 3.5 cm. in diameter. The breasts were small. Examination of the chest was negative. The blood pressure was 118 systolic, 78 diastolic. The genitalia were normal. The extremities showed bowing of both tibias. The left leg was slightly shorter than the right.

The temperature was 98.6°F., the pulse 120, and respirations 25.

The urine showed a specific gravity of 1.020, 20 to 30 white cells per high-power field, 3 to 5 red cells, and no casts. There was a large amount of calcium by rough tests. The blood showed a red-cell count of 3,900,000 with 70 per cent hemoglobin. The nonprotein nitrogen of the serum was 20 mg. per 100 cc., the calcium 14.5 mg., the phosphorus 2.0 mg., the protein 6.8 gm., and the phosphatase 23 units. A phenolsulfonephthalein kidney function test was normal.

X-ray films showed generalized decalcification of the bones and scattered cystic areas. There was an old probable pathologic fracture of the neck of the left femur with coxa vera deformity. There was a large stone in the left kidney pelvis with several small stones in the calices and one small stone in the lower pole of the right kidney. Chest films showed a mass 5 by 2.5 cm. in the right upper mediastinum displacing the trachea and esophagus slightly to the left. There were small

cysts in the acromial end of the left clavicle. There was a small cystic area in the right maxilla.

On the fifth hospital day an operation was performed.

Differential Diagnosis

Dr. Alfred O. Ludwig: May we see the x-ray films?

Dr. George W. Holmes: These films are quite characteristic of what I would expect you to call it.

Dr. Ludwig: I expect them to be characteristic of hyperparathyroidism.

Dr. Holmes: This is a picture of the skull. The parts which are affected show decalcified bone. This shadow in the kidney is characteristic of the type of calcium deposit we see in these cases. The bones in the pelvis also show decalcification with multiple cysts and fractures. The findings are certainly characteristic of hyperparathyroidism. In these cases which have had an unsuccessful neck exploration the problem is to find the parathyroid tumor. Sometimes the roentgenologist can help. I have seen the tumor in one case, but I cannot see it here. The treatment was not given in this hospital. Dr. Hampton, will you point out the tumor?

Dr. Aubrey O. Hampton: I think you can see it in this film taken before treatment, the original film taken in 1936.

Dr. Holmes: There is no doubt that there is a mass present, but I wonder how you could be sure it was not an enlarged thymus, for instance.

Dr. Hampton: I would not know that it was parathyroid. It is a mass.

Dr. Ludwig: As Dr. Holmes said, the x-rays are characteristic of hyperparathyroidism. The data are quite consistent with that diagnosis. Here is a girl who has fractures and cysts in various bones, hypercalcemia, hypophosphatemia, and a tremendous increase of phosphatase, which ought to be between 4 and 6 Bodansky units and here runs up to 73 units. After she came into this hospital, calcium was looked for in the urine and there seemed to be an increased excretion. No mention is made whether there was increased excretion of phosphorus, although it is usually present in hyperparathyroidism. The story of several neck explorations is not an unusual one. Certainly quite a number of cases studied in this hospital had multiple operations done elsewhere without the tumor's having been found. It is interesting that a note is made in the second paragraph that one of the parathyroids showed adenomatous hyperplasia. There is a type of hyperparathyroidism which is caused by hyperplasia of all the parathyroids.

Dr. Tracy B. Mallory: We never saw a section from that gland, did we, Dr. Albright?

Dr. Fuller Albright: No.

Dr. Ludwig: There was an adenomatous tumor of one, but it seems that the main difficulty was that in the original operation the large mediastinal tumor was not removed. It presumably was an adenomatous parathyroid and was responsible for the trouble. It is evident that the cyst removed could not have been the cause of the difficulty because the blood chemical findings did not change essentially after the operation was performed.

This girl also had a slight amount of anemia, consistent with the disease, and some evidence of impaired renal function. A Mosenthal test showed a concentration of 1.014. We should expect her to concentrate to about 1.025 at her age without any difficulty. We know she had kidney stones and from the description, perhaps some intrarenal calcification as well. One might suspect secondary renal impairment which again is not unusual in long-standing cases of this disease. The large bone cysts are not uncommon in this disease. The phosphatase is proportional to the amount of bone involvement and when there is a great deal, as in this case, the phosphatase is correspondingly high. With very little bone disease the phosphatase may be normal. The only question is, Should anything else be considered in differential diagnosis other than a disturbance of the parathyroids, hyperplasia of a number of the glands, or tumor of one of them? I can see very little else that we should consider here. In older people senile osteoporosis may confuse one clinically but in this condition the calcium and phosphorus levels are usually normal. Paget's disease in older people may sometimes be confused with this picture. There is nothing in the x-ray to suggest that, and again the calcium and phosphorus levels help to differentiate as they are usually normal or slightly elevated in Paget's disease, while the phosphatase is elevated, and may be very high. Then, too, in Paget's disease the uninvolved bones are normal, whereas in hyperparathyroidism all the bones usually show some decalcification. Osteomalacia I do not believe need be considered. That is a condition in which decalcification of the bone is due either to a failure of absorption or to a decreased intake of calcium, and in that condition the phosphatase is increased, the calcium is low or normal, the phosphorus is low, and there is usually no increase in excretion of calcium in the urine. One does sometimes see multiple solitary cysts of bone, but they usually can be differentiated aside from the x-ray findings by calcium and phosphorus studies. Occasionally cases of pituitary basophilism or adrenocortical tumors, where there is osteoporosis,

decalcification, and a disturbance of the calcium and phosphorus metabolism, may be confused with hyperparathyroidism, but there are many other features characteristic of these conditions that are not present here, such as obesity, hypertension, hirsutism and red, striated skin. I do not see how one can reach any other conclusion but that this is a case of hyperparathyroidism. I believe that in this case there was a tumor in an abnormally situated parathyroid gland in the mediastinum, where a number have been found in the past.

DR. HOLMES: I have now found out the secret to this case and I think it might be worthwhile to point out some additional factors. This is the film that was taken before the patient came to this hospital. We realize that it was taken with the patient lying on her back and at a fairly close target distance. This shadow which I was afraid might be artefact evidently represents the tumor. It is very much magnified. Following this the patient had a series of x-ray treatments. We have no proof that they reduced the tumor — they may or may not have. The tumor is present in this second film and appears very much smaller, but the way the film was taken and the target distance might account for the apparent diminution in size.

DR. ALBRIGHT: This of course is a perfectly classical case of hyperparathyroidism and I think the forty-first in our series. It is interesting that each case teaches something new. We learned one thing from this case. If you look at the stone by x-ray, it has the appearance of a snowflake with radiation from a central point. We did not know what type of stone this signified. We thought, having seen a stone with this same appearance in another case of hyperparathyroidism, that such a structure might be seen only in that condition. We are in the habit of considering all hyperparathyroid stones as composed of calcium phosphate. We therefore jumped at the conclusion that it was calcium phosphate and thought it might be dissolved by citrate solutions introduced from below. After three days of attempted dissolving, there was no change. In the meantime we took out a stone of the same type from another patient and it proved to be pure calcium oxalate. We found after an operation in the present case that the stone we were trying to dissolve was also calcium oxalate. That explained our lack of success. We now know that all star-shaped stones are made up of calcium oxalate. This is very important since the treatment of a stone depends on its chemical composition.

The operation was done by Dr. Oliver Cope. He entered the upper mediastinum, found the tumor easily and removed it. He left a small piece. When one has a hyperparathyroid tumor with marked bone involvement one does not take out the whole tumor at one time. She had moderate postoperative tetany.

DR. MALLORY: Would it be a fair assumption, with the marked change in the calcium and the phosphorus, to say that the tumor must be a large one?

DR. ALBRIGHT: We never have seen a very small tumor causing as marked disease as this.

DR. MALLORY: So that if it had not been found in the course of two neck explorations it must have been in the mediastinum, assuming that the operator was competent?

DR. ALBRIGHT: Perhaps, but they do get behind the esophagus. A parathyroid can be fairly large and still be missed. They mold themselves in the neck behind and around the other structures and do not cause them to bulge.

A PHYSICIAN: Do you think material removed at the first operation was hyperplastic parathyroid?

DR. ALBRIGHT: No, I think it was normal.

A PHYSICIAN: They said it was embedded in fat.

DR. ALBRIGHT: It certainly was not hyperplastic, if there was any fat.

DR. HOLMES: This is the second case in which repeated explorations have failed and yet the tumor was visible all the time in the x-ray films.

DR. ALBRIGHT: In the best plates, those with barium in the esophagus, you can see the outline of the tumor very easily.

A PHYSICIAN: Do you think the calcium oxalate stone has anything to do with hyperparathyroidism?

DR. ALBRIGHT: Yes. There is no reason why a calcium oxalate stone should not form in this condition. We have one other case.

DR. MOSES S. STROCK: May I say a word, Dr. Mallory? This case, it seems to me, presents a typical history of well-advanced hyperparathyroidism so far as the teeth are concerned. Several years ago she had her teeth removed. If her dental films could be shown they would present all the signs previously described here as being associated with hyperparathyroidism. I think any member of the x-ray department could make a diagnosis from the dental films alone.

PREOPERATIVE DIAGNOSIS

Parathyroid adenoma with hyperparathyroidism.

DR. LUDWIG'S DIAGNOSIS

Hyperparathyroidism.

Anatomical Diagnoses

Hyperparathyroidism.
Adenoma of the parathyroid gland.

Pathological Discussion

Dr. Mallory: The ultimate prognosis on this case depends on two factors: first, the slight possibility that she will develop another parathyroid adenoma, or a large recurrence of this one, and, second, the degree to which her kidneys have been permanently damaged. It is too early to assess this last factor accurately in her case.

CASE 25262

Presentation of Case

A forty-three-year-old married woman was admitted complaining of difficulty in swallowing.

Nine years prior to admission she first experienced a sharp stabbing pain between the shoulder blades on swallowing large mouthfuls of food. During the next four years she had about four similar attacks. Five years before entry the pain on swallowing occurred more frequently. She visited an outside hospital where x-ray films were reported negative. Subsequently she was essentially free from pain until about one year before admission when the pain gradually became quite constant with the swallowing of solid food. Two months later she noted stabbing pains between the shoulder blades, along the sternum, and in her esophagus each time she swallowed. These pains came on soon after going to bed and lasted throughout the night. The following day she visited her physician who advised that the basal metabolic rate be determined. This was low and thyroid treatment was started. Four months later she began to notice a dry feeling in her throat and esophagus when she attempted to swallow. She was found to be anemic and iron therapy was begun. Three months later she complained of difficulty in swallowing air, belching, and difficulty in breathing. X-ray films now showed a constricting lesion in the esophagus. Esophagoscopy done six weeks before admission showed a firm, red, slightly nodular mass at a point 30 cm. from the incisors which completely obstructed further passage of the esophagoscope and appeared to encircle the esophagus almost completely. Several biopsies taken from this area were negative. Two weeks before entry another esophagoscopy was done and a number of more satisfactory biopsies taken. The pathological report on these was leukoplakia. Following these procedures the patient was nauseated and vomited. She regurgitated everything eaten.

Physical examination showed a well-developed, fairly well-nourished woman in no acute distress. Examination of the neck was negative. The heart was slightly enlarged to the left. The blood pressure was 112 systolic, 68 diastolic. The abdomen was slightly tender in the right lower quadrant. Pelvic examination was negative except for a reddened cervix and thick yellow discharge. Rectal examination was negative.

The temperature was 98°F., the pulse 70, and the respirations 18.

Examination of the urine was negative. The blood showed a red-cell count of 4,180,000 with 80 per cent hemoglobin and a white-cell count of 5800 with 62 per cent polymorphonuclears. The nonprotein nitrogen of the blood serum was 17 mg. per 100 cc., chlorides 98.5 milliequivalents, protein 7.2 gm. per 100 cc. A blood Hinton test was negative.

An x-ray film of the chest was negative. A barium examination of the esophagus showed obstruction which started opposite the seventh dorsal vertebra and extended downward a little more than 4 cm. Within the area of obstruction there was an irregular but constant pattern suggesting ulceration. The obstructing lesion reached far upward posteriorly. It was annular for a distance of 3 cm. The lower edge of the lesion was very clear cut. No soft-tissue mass was visible within the area of abnormality. The esophagus below the lesion appeared perfectly normal. Above the lesion it was dilated.

On the third hospital day another esophagoscopy was done.

Differential Diagnosis

Dr. Milton H. Clifford: In summary, this is a woman who apparently has had a lesion in the esophagus, or extrinsic to it, for nine years but showed nothing by x-ray some five years ago and whose symptoms have progressed rapidly only within the last year. At the present time the patient has an annular lesion with posterior extension in the esophagus. There is no reason to suppose that the lesion is primarily extrinsic to the esophagus — no soft-tissue masses being visible. Any lesion must be one that has been present over a long period of time.

I should like to see the x-ray films.

Dr. Richard Schatzki: There are no signs of tuberculosis or pressure on the vertebrae. This is the small area at the junction of the middle and lower thirds with complete destruction of the mucosal relief. There is shelf formation at the upper end of the lesion with slight dilatation of the esophagus above the lesion and normal esophagus below.

Dr. Clifford: What are the possibilities of a

benign lesion in the wall of the esophagus? You would say the mucosal pattern is destroyed?

DR. SCHATZKI: It is completely gone.

DR. CLIFFORD: The possibility of a benign lesion's having been present for a good many years with the recent development of a superimposed carcinomatous process must be considered. There is no evidence to make us think of a neurofibroma. Lymphoma is possible, but there are no other signs such as enlarged lymph nodes, liver or spleen and it is rather a long time for lymphoma to be localized in one spot. Syphilis is a dim possibility, but again it is a long time. Whether the signs of chronic endocervicitis mean gonococcal infection or not, I do not believe is important except that its presence might further suggest syphilis. The Hinton test, however, was negative. A myoma would be a very unlikely possibility. There has been no sign of bleeding at any time. A sarcoma I should consider to be more likely intrinsic, and also to have shown more definite signs of obstruction earlier in the nine years. My final guess would be a carcinoma possibly developing on top of a benign lesion. As a second guess I would mention a leiomyoma.

DR. EDWARD B. BENEDICT: We thought from the beginning in this case that we were dealing with carcinoma of the esophagus, but we had a great deal of difficulty in proving it because the lesion was rather small and showed only slight nodular formation. On the third attempt we did get a positive biopsy of carcinoma. I should like to point out that, in women, carcinoma of the esophagus is apt to run a long course and occur at an early age with prolonged so-called pre-cancerous symptoms. This patient had no metastatic disease, so far as could be determined was a good operative risk and an esophagectomy was performed by Dr. Edward D. Churchill.

DR. TRACY B. MALLORY: A segment of the esophagus was completely removed in this patient; she has safely recovered from that operation and is on the ward waiting for reconstruction of a new esophagus.

DR. EDWIN HAMLIN: The operation was planned with great care by Dr. Churchill and was successful. He first performed a jejunostomy for feeding, then an esophagostomy, to draw the upper end out through the neck, and at the third stage he removed the section of esophagus with the growth and freed up the distal portion of the esophagus down to the diaphragm. At the fourth stage he removed the distal esophagus from the thoracic cavity and brought it out through the abdominal wall.

CLINICAL DIAGNOSIS

Carcinoma of esophagus.

DR. CLIFFORD'S DIAGNOSIS

Carcinoma of esophagus, ? developing on a benign lesion.

ANATOMICAL DIAGNOSIS

Epidermoid carcinoma of esophagus, Grade II.

PATHOLOGICAL DISCUSSION

DR. MALLORY: The tumor was about 5 cm. in length and had not yet quite completely encircled the esophageal wall; it went about three fourths of the way around. There was a relatively small area of ulceration. There was a good margin of normal esophagus at either end of the resected segment. On the other hand the tumor had invaded through the muscular layer and we found tumor in the perineural spaces and lymphatics, so that it is distinctly doubtful if it has been entirely removed.

A PHYSICIAN: Has anyone looked up the literature on surgical treatment of cancer of the esophagus? How many successful cases have been reported?

DR. BENEDICT: About thirty have been successfully removed and several patients have survived for one or two years. Torek's first case in 1913 lived for thirteen years. She was a woman of sixty-seven at the time of the operation, and died of pneumonia at the age of eighty.

DR. SCHATZKI: Was the tumor in the lower end of the esophagus?

DR. BENEDICT: No, mid-thoracic.

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FAMILY TRADITIONS IN MEDICINE

An article in the *Boston Herald* last month, concerning the medical tradition in the Kittredge family, of North Andover, brings immediately to mind other medical families of note. Nine successive generations in the Kittredge family, however, beginning in 1660 when Captain John Kittredge, an irregular but apparently able practitioner, fled from England to this country, and coming to date with Dr. Joseph Kittredge who celebrated his eighty-first birthday on May 21, seem to constitute an all-time record.

We are mindful of a number of medical families that have won our respect and admiration, although, indeed, the same might be said of the other professions and the trades and businesses as well. Various cities have had their own honored medical names where the tradition of service has gone into three, four and even five generations; we point with pride to our Warrens, our Jacksons and our Shattucks, to our Cabots and our Minots and others — solid rocks on which the foundations of medical progress in our community were largely laid.

In some instances a number of individuals of varying ability but of unquestioned integrity have served to carry on the family tradition; in other cases a father and a son have each been of such prominence that a sort of medical halo has seemed to place itself on the family name in their behalf.

There is a nobility about this pursuit of a family tradition, whether it be in medicine, in the law or in trade, that seems to result from the unswerving loyalty of each successive member to that tradition, and the desire of each to acquit himself well in the eyes of his predecessors and of his world. In the accomplishment of this object, ability in general must have been inherited, as well as ambition of the truest and consequently of the most modest type; the most important incentive, however, must have been the constant association with a respected mode of life.

It is the modern exemplification of the old guild system. In this way the art of making the world's most marvelous imitations of flowers has been developed and carried on until a successor was lacking; the spirit of integrity and honor associated with a family name has been made part of the tradition of every business from banking to marketing; generations have lived and died in the honorable pursuit of the law and in the ministry of the church.

The family calling can be a splendid tradition, but it can be so only as the result of freedom of choice. Give a son every opportunity to see the noble side of a profession, and give him an opportunity to see it nobly followed. Let him know also the disagreeable side — the fatigue and the discouragement and the disappointments. Then let him make his choice, and support him in his decision.

A considerable degree of idealism, as well as a good deal of glamour, attaches itself to this following in the family footsteps, but it cannot be forced.

If the family tradition is due to die out with the boy that wants to be an artist instead of a doctor, then let him take his paints and his palette and hie him to the Latin quarter, there to work out his own destiny.

CONTROL OF CANCER

THE tremendous complexity of the problems of cancer control and of research into the nature of cancer is such as to render any clear and comprehensive statement of our present knowledge extraordinarily difficult.

Recognizing the value of stock-taking, even though somewhat superficial, a committee appointed by the Surgeon-General of the United States Public Health Service has prepared a report* of the knowledge acquired in the last thirty years through experimental research, released by Dr. Voegtlin, chief of the National Cancer Institute. The committee preparing this report consisted of Drs. James P. Murphy, John Northrop, Stanhope Bayne-Jones, Ross Harrison and Clarence C. Little.

The report brings out that a large number of diverse ways are known by which cancer may be produced. However, the exact mechanism by which these different substances actually alter cellular activity to cause cancer has not as yet been elucidated. This line of research, intimately concerned with cellular physiology, is being actively pursued in a number of different laboratories, but little information has been obtained as to why the cancer cell has unlimited and uncontrolled powers of growth within the body. Obviously, the complexity of this problem is such that a great deal of fundamental work will have to be done before any appreciable progress can be made.

The relation of heredity to cancer has been considerably clarified in the past, but still more work needs to be done, particularly in view of some of the recent experiments that emphasize the importance of certain extrachromosomal aspects of the hereditary transmission of relative resistance or susceptibility to the development of cancer.

*Fundamental cancer research. Pub. Health Rep. 53:2121-2130, 1938.

Of course, active search for new methods of treatment is an essential of any research program. Although we recognize that through education, leading to detection and treatment of early cases, we could achieve far better results with our present methods than are now being obtained, nonetheless it must be realized that even the best of our present methods leaves much to be desired. Much damage to normal tissues is still inevitable in eradication of the cancerous growth. How far one may go in finding a truly selective agent for the destruction of cancer cells is perhaps too nebulous for speculation, but nonetheless intriguing and important.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

RAYMOND S. TITUS, M.D., *Secretary*
330 Dartmouth Street
Boston

ACUTE INVERSION OF THE UTERUS

Mrs. C. K., a thirty-year-old primipara, entered the hospital February 19, 1939, at term and in labor.

The patient's family history was negative except that her maternal grandmother died of carcinoma of the breast.

The patient had had measles, mumps and scarlet fever as a child. She also gave a history of some kidney or bladder trouble. She had never had an operation. Catamenia began at the age of twelve, were regular with a twenty-eight-day cycle and lasted three to four days, without pain. Her last period was May 12, 1938, making her expected date of confinement February 19.

Physical examination at the beginning of her pregnancy revealed a well-developed and nourished woman. The heart was not enlarged; there were no murmurs. The lungs were clear and resonant. The blood pressure was 110 systolic, 80 diastolic. Pelvic measurements were normal. The abdomen was extremely firm on palpation. The course of her pregnancy was entirely uneventful. Routine examination at her last office visit revealed a breech presentation.

Labor was of short duration, lasting about five

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

hours. The breech came down and was easily extracted under light ether anesthesia. There were no external tears, and very little bleeding. The patient was given 3 minims of posterior pituitary extract. Immediately following this medication, the patient strained violently; the fundus, inside out and with the placenta firmly attached, appeared at the vulva. Ether was resumed, and the placenta carefully peeled off. During this performance, there was surprisingly little bleeding. The fundus was grasped with one hand, squeezed carefully and with no difficulty replaced in the abdominal cavity. The cervix which had contracted about the inverted uterus was very easily dilated. The patient was given 5 minims of posterior pituitary extract, and the operator's hand was held in the uterine cavity until there was definite evidence of contraction. The cervix was then grasped with sponge forceps and brought down to the introitus for inspection. There was very little bleeding. The cervix was intact. The vagina was firmly packed and the fundus palpated. It was symmetrical and in normal position. During the manipulation the patient's pulse rose to 140 but remained of good quality. Her color was good and there was no sweating. She came out of the ether rapidly. She was watched carefully for one hour; during this time the fundus remained firm, there was very little bleeding and her pulse rate gradually dropped. The vaginal packing was removed twenty-four hours later.

Her convalescence was afebrile. The uterus involuted normally and the lochia was not foul at any time. The cervix was examined on the tenth postpartum day and appeared normal and well contracted.

Comment. This case of spontaneous inversion of the uterus may have resulted from the 3-minim dose of posterior pituitary extract. There was very little bleeding because the placenta had not separated at all when the inversion occurred. Furthermore, the fundus was replaced so quickly and so easily after the placenta had been removed and it remained so well contracted that the sinuses had no opportunity to remain open. The use of the vaginal pack after the uterus had been replaced was probably valueless. This condition, potentially so serious, was treated so quickly and so expertly that it is an example of how acute inversions should be handled. Practically all acute inversions, if treated immediately, can be replaced in this manner. It was extremely fortunate that so small an amount of blood was lost in this case; the hemorrhage is tremendous in most cases. Transfusion often plays a very important role in treatment.

RHEUMATIC FEVER*

Rheumatic fever is a common disease in Massachusetts. It is often called inflammatory rheumatism. It usually begins between the ages of five and fifteen years, although it may start in adult life. In some way, sore throats and colds are very closely connected with the beginning of rheumatic fever. This close association has been known for many years, but we do not yet know the exact cause of the disease. Chorea, commonly called St. Vitus's dance, occurs very frequently during rheumatic fever or in patients who have had rheumatic fever in the past.

At the beginning of the disease, the child or young adult often complains of a sore throat and is sick for two or three days, usually with slight fever. Recovery seems complete. Within a few days, or sometimes not for two or three weeks, there is the rather sudden onset of illness with high fever, a rapid pulse and sweating. Often pain occurs in the patient's joints — most frequently in the ankles, knees, hips, wrists, elbows and shoulders. The pain may be severe or slight, and at times the joints may be swollen and very tender. It is common for the pain to jump from one joint to another. There may be other symptoms such as nosebleeds, pain in the chest or stomach, vomiting and often rapid breathing. The diagnosis should be made only by a doctor.

Although the joints may be very painful at the beginning of the illness, this is not always so, and pain may be mild or absent. Rheumatic fever does not result in any permanent joint trouble. It is the heart disease caused by rheumatic fever which is the most serious part of the disease. In most cases, heart disease begins soon after the patient becomes sick. We now know that the heart disease is not a complication, but is usual in severe cases. All three layers of the heart are damaged. First, the lining, causing trouble with the proper working of the valves — often called "leakage of the valves"; second, the heart muscle, causing enlargement of the heart and, often, heart failure; third, the outside covering of the heart.

Once rheumatic fever has begun it usually lasts for weeks, more often months, and sometimes several years. It usually persists a shorter time in adults than it does in children. Adults also seem less likely to develop heart disease than are children. One of the worst features of rheumatic fever is that the patient is apt to have repeated attacks. These new attacks, or recurrences, are especially likely to take place during the first five or six years after the disease begins. For this reason, it is important for the patient to see his doctor often for some years after the initial attack. These repeated attacks of rheumatic fever usually follow sore throats and colds, but they may follow accidents, operations or various other diseases or they may happen without any known cause.

The symptoms during chronic rheumatic fever may be very mild, but are still important. I have told you what some of them are. Others are: loss of weight; a non-itching rash, which does not last long, on the body, arms or legs; small, painless lumps or nodules over the joints; and jerky movements of the muscles indicating St. Vitus's dance. After these symptoms go away, laboratory tests may show that the disease is still going on. It is important to keep the patient quiet so long as there are symptoms or laboratory tests which show that the disease is still active.

A patient with rheumatic fever should be under the care of a doctor. When very sick, the patient needs the best medical care and good nursing. These patients are

*A "Green Lights to Health" broadcast given by Dr. T. Duckett Jones on Wednesday, April 26, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

best treated in hospitals. Hospital care becomes even more important if the patient has heart failure. As the patient improves, plans must be made for good bed care for a period of months. It is unfortunate that rheumatic fever occurs most commonly in families where the income is small and the home is crowded. Under such conditions it is hard to give the patient proper bed care for long periods of time. There exist a few hospitals and foster homes where this long-time bed care may be given, but there are not enough beds at present to care for the large number of rheumatic-fever patients. It is important during these long rest periods to allow the patient to learn something about the disease he has, to keep his mind occupied in instructive work or play, and to have his schooling continue. Massachusetts should be proud of an educational system which provides visiting teachers for these patients in their homes. All institutions giving long-time care also provide schoolteachers.

There is much good advice which the doctor can give the patient or the family when the rheumatic fever is no longer active. Home conditions should be bettered, good nourishing food provided, rest periods suggested, and physical activity directed. The patient must be warned to avoid exposure to bad weather and to persons with colds and sore throats.

Rheumatic fever is important to us all. It causes 99 per cent of all heart disease in childhood and early adult life. For this reason, rheumatic fever is one of the important medical problems of the day. While rheumatic fever is a serious disease, by no means all patients with rheumatic fever develop severe heart disease or even have their future lives changed because of the disease. Many patients who have been closely watched over a period of years have little or no heart disease and are able to lead normal lives. In some cases, evidence of heart disease may disappear entirely, if the patient remains free of these later attacks of rheumatic fever. The severity of the attacks of rheumatic fever is the important point with regard to its effects. Some are so mild as to be discovered only by the physician. This is a further reason for frequent visits to the doctor.

In summary, the problem becomes one of proper care over a period of years. When very ill, the patient needs to be in a good hospital. Except in rare cases, long bed care must be given as the patient improves. With care to avoid sore throats and colds, further attacks may be prevented. The doctor should be seen often to determine whether or not the patient has active rheumatic fever, and to give helpful advice. If this can be done, in a majority of the cases the patient will be able to be physically active as he grows older.

* * *

Q. Is rheumatic fever inherited?

A. Much study is at present being given to this question. We know that rheumatic fever often occurs in more than one member of a family; in fact, at least as often as does tuberculosis. Certain physicians believe that the disease tends to run in families. As yet, we cannot state for sure that it may not be mildly contagious. This may be more important than heredity.

Q. Do you believe then that it is contagious?

A. It has been well shown that rheumatic fever spreads through families as the result of sore throats and colds. Exactly how these infections play a part in rheumatic fever is unknown, but it is possible that during colds and sore throats the agent causing rheumatic fever may be spread from one person to another. However, this remains to be proved.

Q. Do you think the cause of rheumatic fever will ever be found?

A. Yes, but it may take many years. Several groups of research workers are carefully studying the disease. It is a very difficult problem, but one that physicians should be able to solve in time.

Q. If a patient has had rheumatic fever with but little or no heart disease, what are the chances of his remaining well?

A. The chances are excellent. The first two or three attacks of rheumatic fever usually cause the greatest amount of heart disease. If the patient has but little heart disease six or eight years after the first attack, the chances are greatly in favor of his remaining well.

Q. Is diet a very important part in the treatment or prevention of rheumatic fever?

A. In a general way, yes. There is no single food which is all important. It is wise to have an abundance of fresh vegetables, milk and fruit juices. Fruit juices supply vitamin C, which all patients with chronic infection need in large amounts. It is also wise to give the patient vitamin D during the winter months. This can be done with the use of cod-liver oil or other preparations advised by the doctor.

Q. You mentioned nosebleeds. Do they mean that a person has rheumatic fever?

A. Most nosebleeds in children are caused by injury, such as blows or picking the nose. Nosebleeds occur frequently without injury during rheumatic fever, but the patient usually has other symptoms, and only a doctor should decide that they mean active rheumatic fever.

Q. Why do you suppose rheumatic fever is commoner in families with small incomes?

A. That is not answerable at present. It is probable that with poor living conditions and overcrowding, the patient comes in touch with more infectious agents and larger doses of them. In addition, poorer food may help lower the resistance of the patient.

Q. You have not mentioned the tonsils. I was always told they could cause rheumatism, and I wonder if this is true.

A. Formerly many doctors believed this to be true. Many patients, however, get rheumatic fever long after their tonsils have been removed. Also, we have noticed that taking out the tonsils seems to have little effect on the course of rheumatic fever. We still believe the tonsils should be removed if the patient has very many sore throats, or tonsillitis. Such an operation, however, will not cure the disease.

Q. If a person in early adult life has rheumatic heart disease, what advice should be given him about exercise?

A. If the heart disease is slight, and he has not had rheumatic fever for some time, the doctor will probably allow moderate exercise. If rheumatic fever is present, even mildly, he needs bed care. If rheumatic fever has been recent, an inactive life will be advised. If the rheumatic heart disease is moderate to severe, the doctor will advise moderation in exercise. In some patients it is necessary to avoid sudden strains, such as occur in violent games. In others, the patient must be taught to lead a quiet life and even trained to do some kind of work which can be performed without effort.

Q. I wonder if the new drug, Prontylin, is helpful in rheumatic fever.

A. No. Once a rheumatic patient has a sore throat it will not prevent a fresh attack of rheumatic fever. This drug is also known as sulfanilamide. It has been given to

many patients with rheumatic fever. It seems to do no good, and at times may be harmful. I should advise against its use.

Q. Is exposure to the sun of benefit to these patients?

A. If a patient is not very ill, exposure to the sun in small amounts is probably helpful. Heavy tanning is unnecessary. Actual sunburn should not be allowed. We have seen fresh attacks of rheumatic fever associated with severe sunburn.

Q. In your discussion you mentioned loss of weight in connection with active rheumatic fever. Just what has weight to do with the disease?

A. Loss of weight and failure to gain weight are often found when the patient has active rheumatic fever, even mildly. As patients with rheumatic fever improve, they almost always gain weight. Weight is hence a rough guide to the patient's condition and should be watched.

Q. What is meant by a person who says that he has "rheumatism"?

A. Rheumatism comes from the Greek word meaning "to flow." It has hence been used for all types of diseases in which pain occurs in different joints or even muscles. More recently, rheumatism has been used by doctors in those diseases in which the patient has real — often permanent — changes in the joints. This is more properly called arthritis, of which there are several types. Joint pain may occur in rheumatic fever, but may be mild or absent, — never permanent, — and heart disease is the important part of the condition. Hence, rheumatic fever should not be called "rheumatism."

Q. Colds and sore throats seem to be important in rheumatic fever. Have you any suggestion as to how these may be prevented?

A. There is no sure way of preventing colds and sore throats. Vaccines are not thought to be very helpful. The best way to prevent these infections is to stay away from people having them, as they are highly contagious. This, of course, is difficult. The rheumatic-fever patient can help protect himself by staying away from crowds when colds are common, and even by keeping out of the way of brothers and sisters when they are sick. A common source of colds is the school. Intelligent teachers can help prevent their spread. It is wise for the rheumatic-fever patient to have a room alone, or at least to sleep alone. He should avoid exposure, drafts, and so forth.

Q. What is the present need in Massachusetts for the care of rheumatic-fever patients?

A. The greatest need is for places where patients can receive long bed care during the stage of active rheumatic fever. Especially is this care needed for boys over twelve years of age and for young men. Very few beds exist for these groups. This is a crying need, and every effort should be made to meet it.

DEATH

CROCKER — Benton P. Crocker, M.D., of Foxboro, died May 26. He was in his seventy-third year.

Born in Hyannis, he attended Amherst College and the University of Vermont Medical School and received his degree from the Bellevue Hospital Medical College in 1891. He became resident physician at the Winchendon Sanitarium and later was resident physician at the New York Lying-In Hospital. He went to Foxboro in 1894, where he had practiced since. He was town doctor for several years.

Dr. Crocker was a member of the Massachusetts Medical Society and the American Medical Association.

His widow, two daughters, two sons, a grandson and two sisters survive him.

MISCELLANY

NOTE

At the commencement exercises of Wayne University on June 16, Dr. Harris P. Mosher was given the honorary degree of LL.D.

REPORTS OF MEETINGS

HARVARD MEDICAL SOCIETY

At a regular meeting of the Harvard Medical Society held at the Peter Bent Brigham Hospital on Tuesday, March 14, Dr. Joseph Aub acted as chairman.

The first case, from the medical wards, was presented by Dr. A. C. England, Jr. A fifteen-year-old boy came in with a chief complaint of intense pain in the lumbar region of three weeks' duration. He had a past history of four attacks of chorea between the ages of eight and ten, each lasting one month. Two years previously he had developed osteomyelitis of the left hand; the fourth finger had to be amputated. Three weeks before entry he was injured while playing basketball and two days later developed intense pain in the left flank and then in the right flank. He was in bed at home two weeks, and as fever developed, he was brought into the hospital. On physical examination, one observed a feverish boy with a positive Kernig, stiff neck, costovertebral-angle pain and tenderness, spasm of muscles, and a slight scoliosis at the tenth and eleventh thoracic vertebrae, concave to the left. His temperature was 102°F., the white-blood-cell count was 13,000 with 80 per cent polymorphonuclears; lumbar puncture done twice showed clear fluid with no cells and a negative gold-sol curve and Wassermann test; the blood Wassermann test was also negative. He was given bed rest and did well, with no discomfort and with lessening of the pain and stiffness of the neck. The scoliosis increased a bit but then made no further progress. By x-ray, a process in the base of the left lung cleared in five days. The spine plates were negative, but there was a shadow behind the heart which was associated with the scoliosis, with some erosion of the tenth and a narrowing of the joint space between the tenth and eleventh thoracic vertebrae. The patient was placed in a posterior shell and at present is afebrile.

Dr. Marshall Fulton in discussing the case brought up the possibility of the x-ray shadow's being due to pus from the vertebra. Dr. Merrill C. Sosman re-read the x-ray films as showing a posterior gutter empyema. The first film showed a bronchopneumonic process, which probably went on to pleurisy and then empyema, with associated narrowing of the intervertebral space. However, this sequence might well have been in reverse order. Dr. Sosman thought the process was too acute to have been due to an acid-fast infection in the disk.

The second case was presented by Dr. C. F. Goeringer, and was from the surgical wards. The patient, a sixty-eight-year-old woman, was admitted March 5 for treatment of a three and a half months' progressive enlargement of a mass in the neck. She had had no thyrotoxic symptoms and had not lost any weight. Two and a half weeks before entry she began to have dyspnea and then orthopnea; five days before entry her respirations became wheezing in character, and two days before became quite

labored. Physical examination revealed an orthopneic wheezing woman with a temperature of 102°F. and equal blood pressures in both arms. In the right side of the neck was a baseball-sized mass, firm, non-fluctuating, non-tender and slightly movable. X-ray films demonstrated the trachea deviated to the left. She was transferred to the surgical service, and two days later a decompression operation was performed. Biopsy suggested a tumor compatible with a lymphoblastoma. The patient's course improved following two x-ray treatments. At present she can lie flat in bed without distress. She is to have further x-ray therapy.

Dr. Joseph C. Aub remarked that neoplasm of the thyroid gland was almost never hyperactive in function. Dr. Elliott C. Cutler stated that the patient had had serious obstructive signs and that immediate x-ray therapy would have surely caused edema and death. For that reason a large specimen was taken at biopsy. Dr. Cutler said that at the time of operation he did not believe it was a lymphoblastoma, but also that it was not typical of an epithelial tumor of the thyroid. Dr. Guy D. Ayer reported that preliminary pathological study indicated an undifferentiated small-cell malignant tumor, the cells being related to blood vessels and occasionally containing vacuoles. Therefore, he predicted a thyroid tumor of rare type.

The main program of the evening was a symposium on "How Does One Study Cancer?" presented by six of the investigators from the Collis P. Huntington Memorial Hospital.

Dr. Aub introduced the topic by briefly reviewing the history of cancer research. He said that, in general, cancer is still an unknown entity. Neither is it known what change in the cells predisposes to cancer, nor is therapy as yet satisfactory. Since the turn of the century, however, a great deal of information has been gathered, as a result of the discovery of x-rays in 1895 and of radium in 1898. The Huntington Hospital was founded in 1899. In 1903 the first successful transplantation of a tumor from animal to animal was achieved. In 1907, Dr. Tyzzer established the fact of inheritance of tumors, a most fundamental discovery. In 1911 two Japanese investigators first produced tumors in animals by rubbing tar into the skin. Previous to that it had long been known that chimney sweeps often developed cancer. In 1910 Carrel grew tumors in vitro. Rous and Murphy produced filterable virus tumors in chickens. In 1923 Warburg made his great discoveries, and in 1931 tumors were produced by a crystalline substance derived from tar. This all means that within the last forty years all the technics or tools necessary for producing and studying tumors have been made available to investigators.

The first paper was presented by Dr. I. T. Nathanson on "The Effect of Testosterone on Development and Growth of Spontaneous Mammary Cancer in Female Mice." Spontaneous mammary cancer in female mice has been developed and its incidence standardized by inbreeding of pure strains. Loeb, of St. Louis, castrated such female mice before puberty and thus reduced this incidence. If spayed after puberty the incidence was also decreased, but was not so marked. Lacassagne injected the female sex hormone into mice of both sexes and increased the incidence of mammary cancer. Others have confirmed and extended this work. Recently, Lacassagne injected testosterone into high-cancer female mice, in small doses, and obtained no effect. The author, using larger doses, undertook the same problem. Some 40 mice of approximately the same age and of the same descent were divided into two groups of 20 each. These mice ordinarily develop tumors in six to eleven months after birth if mated once. One group was given testosterone propionate in 0.5-mg. doses in 0.05 cc. of sesame oil three times a week just after the age of four months and after parturition. At the eighth month of age, 6 of the treated mice had developed mammary cancer whereas 11 of the controls had cancer. After the eighth month no more of the testosterone-treated mice developed tumors, whereas 100 per cent of the control mice had developed tumors by the twelfth month. At this time mortality due to the testosterone injections per se came into consideration. Ten animals of the treated group were still living, without tumor, at eighteen months of age. All control animals died with tumor by the fourteenth month. Of the treated mice none had more than one tumor, whereas in the control group 12 developed two or more tumors.

An experiment to study the effect of testosterone on the growth of existing tumors was carried out on 48 animals, half of which were used as controls. The mean diameter, based on measurements of the tumors in three planes was used for comparison. Doses up to 5 mg. per day had no effect on the rate of growth of the tumors.

Histological studies on the experimental material revealed that the effect of testosterone is on the glandular acini and ducts producing a change toward the male type of mammary gland, both in virgin and in pregnant mice. Dr. Nathanson concluded by stating that the experimental evidence presented indicated that estrogens are not carcinogenic per se as regards mammary cancer in mice.

The second paper on "Tissue Inhibitors" was given by Dr. A. M. Brues. Individuals on becoming adults have their growth completely inhibited except in emergencies such as the repair of wounds. Cancer does not seem to be controlled in this way. Tissue cultures when liberated from the body grow freely, but the more "adult" the tissue the longer it takes to shake off the shackles of inhibition. Since the tissues become free of the inhibitory factors, they make good subjects on which to test the inhibiting powers of various substances. Thus, simple saline liver extract is a good tissue-growth inhibitor. Dr. Subbarow has been able to isolate a substance which is non-toxic but a good inhibitor. This compound is ethanolamine. It has been shown that the extracts do not interfere with tissue metabolism, and embryonic hearts keep on beating in their presence. Dr. Brues found that inhibition of growth by amines was much more effective at pH 8 than at pH 7, and that malignant growths flourished in a zone far out on the alkaline side and in high concentrations of the inhibitor, where normal tissue would not survive. Is this because the interior of a tumor cell is more acid than normal? This is likely, but difficult to prove. Various other inhibitors were studied, but the amines described were the only substances capable of so differentiating normal and malignant cells.

Dr. William T. Salter presented the third paper on "Comparison of Benign and Malignant Tumors." Implanted tumors in animals are now surprisingly uniform and reliable in their transmission. There is also a standard method of producing malignant disease experimentally by this means, and the histological character of tumors so produced is well known. With this for groundwork, Dr. Salter experimented on "tumor immunity." A tumor of well-known character and properties was implanted on the tail of a pedigreed mouse from a highly inbred strain. After a time the tail was amputated, and a second implantation of the same stock sarcoma was tried on the mouse's body. Whereas in control animals "takes" occurred in practically 100 per cent of cases, in

the "immunized" mice the incidence of body-takes was materially reduced. Besides, in some such mice the implanted malignant tumors became slow-growing and less malignant, and in others the growth was benign. The percentage of mitotic figures after administering colchicine was used as a check on the mitotic activity. Theelin, administered subcutaneously, was found to increase this "tumor immunity." Dr. Salter and his collaborators studied the resultant benign and malignant tumors by comparing their respective metabolisms of oxygen, carbohydrate and nitrogen, and could determine no characteristic difference between the artificially "benign" and the malignant sarcomas. Therefore, he concluded that benignancy is a property of the host as well as of the tumor itself.

Dr. Shields Warren talked on "The Contribution of Pathology to Guidance in Radiation Therapy." Radioresistance and sensitivity have so far been based largely on empirical grounds. As a general rule, the more embryonic the cell type the more radio-sensitive it is, but exceptions are almost as frequent as the cases that follow the rule. It is for that reason that different tumor types have been sorted and classified on a basis of previous experience with respect to radio-sensitivity. However, one has found that in almost all cells the early prophase is the mitotic stage at which sensitivity is greatest. Certain changes take place in irradiated cells: mitosis is arrested or disturbed; later, vacuolization occurs — abnormal cells appear or calcification develops; the Golgi apparatus shows various stages of swelling, with subsequent disintegration or a return to normal; the same changes occur with respect to the mitochondria. A sublethal dose is followed by a tendency to recovery in eighteen to twenty hours. For this reason, radiation once a day is sound therapy. Another fact that has been discovered is that in plant cells the longer the chromosomes the better is the response to radiation, with some exceptions. This may be a good clue to a future classification of tumors for prognostic and therapeutic purposes.

The fifth paper was presented by Dr. Richard Dresser: "Results of Radiation by the Million-Volt Machine on Bladder Tumors." The electrostatic belt-conveyor type of supervoltage x-ray machine has been brought to a high degree of mechanical perfection. The wave lengths of the beam at a potential of one million volts are shorter and more penetrating than any x-rays thus far generated for therapeutic purposes. Briefly, the advantages of this type of radiation are fourfold: 20 per cent more radiation can be delivered to the center of the human pelvis than is possible with 200-kilovolt rays; the skin tolerates nearly twice as much million-volt radiation; when smaller portals of entry are employed, there is less general reaction on the part of the patient; the amount of radiation delivered to a deep-seated tumor is largely independent of the size of the portal entry. In a series of 24 cases of bladder tumors treated with 200-kilovolt rays, which was recently reviewed in collaboration with Dr. Roger Graves, it was concluded that external radiation by this method was of value only as a palliative measure. Thus far, 57 cases of carcinoma of the bladder have been irradiated by the million-volt machine. In round figures, a third of these cases have shown complete regression, a third partial regression, and a third no response to treatment. It is believed that the dosage thus far administered is not curative, but a greater palliation has been secured than with other external methods of radiation. In the brief experience of two years, the technic of million-volt radiation has, of course, been improved.

The sixth and last presentation was by Dr. Grantley W. Taylor: "Surgical Treatment of Cancer of the Lip." Dr. Taylor stated that the problem in treating cancer of the lip was to decide when to operate on the neck nodes. He did not give any opinion on this score, but merely presented statistics from which one could draw conclusions. The cases reviewed came from the Huntington, Pondville and Massachusetts General hospitals. The first factor considered was the size of the tumor, since it roughly indicated the duration of the disease and the amount of metastasis. Of 93 patients with carcinoma less than 1 cm. in size, 7.5 per cent had positive lymph nodes, and of these last, 57 per cent were cured by radical surgery. Of 328 patients with a tumor 1 to 2 cm. in size, 13 per cent had positive nodes, of which 55 per cent were cured. Of 136 patients with a tumor 2 to 3 cm. in size, 37 per cent had positive nodes, of which 51 per cent were cured. Finally, of 59 patients with a cancer larger than 3 cm., 24 per cent had positive nodes, of which 43 per cent were cured, but this was actually a group favorably selected for surgery. The second factor was the duration of the lesion, but as with all historical data, it is apt to be inaccurate. The third factor was the grade of the carcinoma. Grade 3 tumors had the highest incidence of positive nodes. The fourth factor was the presence and size of the cervical lymph nodes in relation to their actual involvement. Of those with nodes less than 1 cm. in size, 10 per cent were positive on biopsy; of nodes over 2 cm. in size, 91 per cent were positive.

SUFFOLK DISTRICT MEDICAL SOCIETY AND NEW ENGLAND PEDIATRIC SOCIETY

On Wednesday, March 29, 1939, at the Boston Medical Library, there was a combined meeting of the Suffolk District Medical Society and the New England Pediatric Society, at which Dr. Albert D. Kaiser of Rochester, New York, spoke on "Significant Facts in the Tonsil Problem in Children." Dr. R. Cannon Eley presided.

In emphasizing the importance of the problem, Dr. Kaiser reminded the audience that the question of the removal of tonsils and adenoids comes up for decision in almost every child before the school age has been passed. For, although nutritional problems, with special emphasis on the vitamins and minerals, have been indicted with increasing frequency in the retardation of growth, the tonsil still receives considerable notoriety. More recently, the vogue for chemotherapy in upper respiratory infections has been holding the spotlight. In the face of this confusion, therefore, it behooves the doctor to know how to evaluate the operation for removal of the tonsils and adenoids in children. Dr. Kaiser bases his conclusions on 4400 cases, equally divided into operated and unoperated groups, and presents his data as answers to commonly asked questions.

Do tonsils have any useful function in a young child? They play a role similar to other lymphoid tissue in regard to drainage of infected foci, as shown by a group of English workers who injected dyes and bacteria into the paranasal sinuses and demonstrated their excretion through the tonsils. This protective mechanism is especially potent under five years of age, when the lymphoid tissue of the pharynx shows its greatest development and when removal of the tonsils increases the incidence of infection, according to Dr. Kaiser's data. Some recent work by the speaker is suggestive that the vitamin C levels of tonsillar tissue and the blood have similar values, and that the numbers of bacteria that can be cultured from the center of the tissue are inversely proportional to the vitamin C content. It is concluded, therefore, that the tonsil does play a protective role of some nature, at least in children under five years of age.

Is the presence of tonsils a handicap to normal development? Unless there is some specific indication for tonsillectomy, no advantage accrues to the operation. Twelve hundred cases which were recommended for removal but failed to undergo surgery showed comparable development to 1200 operated cases, and in general fared as well except for a slight increase in the number of sore throats and rheumatic infections. Furthermore, those patients who had the "benefits" of tonsillectomy under five years of age showed no definite improvement except in obstructive symptoms, either of deglutition or breathing. Examination ten years later of the two groups showed barely perceptible differences in the size of the tonsils, presumably due to atrophy in the unoperated group. Dr. Kaiser concludes from this study, therefore, that no doctor need fear that failure to remove the tonsils is a grave error of omission.

Is the incidence of infection decreased by tonsillectomy over a control group when the preoperative indications are the same? Data based on 4400 cases equally divided indicate that the common complaints are recurrent tonsillitis, head colds, otitis media, cervical adenitis, lower respiratory infections, measles, diphtheria, scarlet fever and rheumatic fever. The only statistically significant improvement in the operated group after ten years is the lowered incidence of tonsillitis, cervical adenitis and rheumatic fever, while the reduction in the number of head colds is suggestive. Laryngitis, bronchitis and pneumonia show a higher incidence in the operated group here as in other studies, but this is probably a reflection on the susceptibility of those chosen for surgical intervention rather than on the procedure itself. One may conclude, however, that tonsillectomy does not protect against the latter infections. Although the operated group shows a statistically insignificant decrease with regard to scarlet fever, there is little doubt but that the course, when the disease is contracted, is smoother and the prognosis more favorable than it is in the unoperated group.

Rheumatic infection constitutes the most debated if not debatable subject. In the first place, it is generally accepted that tonsillectomy is not indicated in a patient with chorea, who becomes worse, if anything, after operation. In regard to the joint and cardiac manifestations, however, there is more hope. For, although the incidence of initial attacks is reduced only 20 per cent or less by removal of the tonsils, the greatest value lies in the reduction in mortality. Thus, those who retained their tonsils had a 13 per cent mortality, while those whose tonsils were removed at the first attack had a 7 per cent death rate and after the first attack one of only 4 per cent. This occurred in the face of no reduction in recurrences. Dr. Kaiser interprets these data to mean that some benefit is to be gained by removing tonsils which are subject to repeated infections.

To Dr. Kaiser's way of thinking, contraindications to tonsillectomy include such conditions as acute infections, particularly respiratory, pulmonary diseases and blood dycrasias. He emphasized the importance of refraining from operation during an acute rheumatic episode. There is evidence accumulating which indicates that the poliomyelitis season should be avoided, for the high incidence of the bulbar form of this disease in patients who have recently undergone tonsillectomy seems more than mere coincidence.

The speaker's indications for tonsillectomy rest on the compilation of these extensive data, and striking benefits may result when operation is based on proper preoperative indications. In obstructive symptoms one may expect 75 per cent improvement; in sore throats, cervical adenitis and cyclic vomiting, 50 per cent; in recurrent colds, otitis media and rheumatic infection, 25 per cent; and in asthma, pneumonia, bronchitis and chorea, none. The appearance of the tonsils is not a reliable criterion for operation, for the removal of small, clean-looking ones is often as beneficial as that of those which are large, boggy and purulent — provided the indications are otherwise comparable. Probably the most important single factor in determining the advisability of tonsillectomy is an accurate history. Although it is no disgrace to refuse to perform the operation, it should be elected in proper instances.

In opening the discussion, Dr. Francis L. Weille warned that Dr. Kaiser's data might be widely employed as a basis for the wholesale retention rather than removal of tonsils. Using Dr. Kaiser's own statistics on otitis media, Dr. Weille stated that, in his opinion, the benefits claimed had been greatly minimized; for although the incidence of this condition normally decreases in the age group between five and fifteen years, the number of cures in the operated group is approximately twice that of the controls, which is most significant.

Dr. Kaiser replied that he merely attempted to interpolate the fact that those in the unoperated group were probably progressing satisfactorily whereas the others were more susceptible. In other words, it is practically impossible to obtain biologically equal groups.

Dr. Warren R. Sisson asked the following questions: Granted that it is desirable to remove diseased tonsils and retain normal ones, how shall one determine the latter? How can the number of cases unnecessarily operated on be reduced?

Dr. Kaiser replied that the definitely pathologic tonsils with expressable pus and cervical adenopathy throughout the winter season present no diagnostic problem. There is no good criterion, however, in border-line cases, and the history is still an indispensable asset. The school doctor, on one cursory examination, can express no reliable opinion, although he often does make an indelible impression on a child's mother by such a proclamation.

The problem of reducing the number of superfluous operations lies at least partly in the social system, for the incidence in Buffalo varies from 30 per cent in the poorest public school to 98 per cent in one of the better private schools. This direct relation between tonsillectomy and social status obtains throughout the entire scale, not only there but in other large cities. Neither extreme is probably the correct proportion, unnecessary operations constituting approximately 25 per cent.

Dr. Lyman G. Richards asked whether there was any reason why the adenoids should not be spared when there are no specific indications for their removal except as a part of the operative procedure. He added that it has been asserted that they may exert a sparing action, whereas their removal merely stimulates reaccumulation of lymphoid tissue in the nasopharynx.

Dr. Kaiser replied that there are no statistics on this important problem, and the conjecture is that it may be wiser not to denude the entire nasopharynx; for Nature certainly causes tremendous lymphoid hypertrophy during subsequent infections of that region. The opposite suggestion, of removing only the adenoids, seems logical for recurrent head colds. Comparison of the results in patients with complete and incomplete removal of the pharyngeal lymphoid tissue shows essentially no difference after a ten-year period.

Dr. Harold G. Tobey said that the importance of the problem in relation to deafness demands more attention. Of the more than 3,000,000 deaf in the country, only 5 per cent of the cases are due to the main congenital causes — otosclerosis and nerve deafness. The adhesive type, which

occurs at fifteen to twenty years of age, is undoubtedly associated with repeated closure of the eustachian tube, and otitis media and mastoiditis are not necessarily factors. In view of this important economic loss, the number of operations is no disgrace, and certainly complete removal of lymphoid tissue, especially in the fossa of Rosenmüller, is indicated.

Dr. Kaiser said that tonsils and adenoids certainly should be removed in the face of recurrent middle-ear infections or incipient deafness, but that there is no suggestion that such procedure is beneficial prophylactically. Mastoiditis, like sinusitis, has an increased incidence in the operated group. But this does not vitiate the fact that mastoiditis is not necessary for adhesive deafness.

Dr. Conrad Wesselhoeft added that tonsillectomy more favorably affects the course and sequelae of scarlet fever than statistics suggest. In the first place, about 25 per cent fewer contract the disease, although they may have a sore throat. But more important is the interpretation of the data which seem to indicate that the procedure is of questionable value in preventing the complications of otitis media and mastoiditis. These very conditions are the indications for tonsillectomy, and these same children without operation would show to even worse advantage compared with a so-called control group in which operation was not performed.

To the question as to what were his indications for operation, Dr. Kaiser replied that, under five years of age, obstruction and deafness demand intervention, while over five years the indications are recurrent tonsillitis and cervical adenitis, rheumatic fever, cyclic vomiting, and malnutrition when all else has been ruled out.

Dr. Charles F. Walcott said that the individual patient cannot be judged by age or any set criteria, and that it is often wise to ask what one would do with one's own child. Advice should always be sought from the family physician, who is well acquainted with the patient and with the reaction during past attacks and during quiescent stages. One examination during one attack is not sufficient for a consulting specialist to make an intelligent decision as to the advisability of a tonsillectomy.

ALPHA OMEGA ALPHA

At the Harvard Medical School on April 28, President Donald D. Matson, of the Harvard chapter of Alpha Omega Alpha, presented Dr. Eugene M. Landis, assistant professor of medicine at the University of Pennsylvania School of Medicine, who spoke on "The Effects of Kidney Extracts on Blood Pressure."

In introducing his intriguing subject, Dr. Landis reminded his audience that results so far obtained in the field of experimental hypertension, while of the highest importance, must still be amplified and extended before clinical application is possible. However, any additions to or improvements in the present knowledge of the etiology and pathogenesis of this distressing and fatal condition will of necessity show the direction for further investigation and treatment. After the conclusion of his humble prelude, this contributor to the field of vascular physiology proceeded to delight his audience with a well-organized, well-presented and fundamentally sound report on the work being carried on in Philadelphia concerning the physiologic activity of extracts prepared from kidney tissue.

In a short review of the outstanding historical developments in cardiorenal vascular physiology, Dr. Landis reemphasized the well-known controversy between the schools which postulate the kidney or the general vascular system as the primary instigator of hypertension. With the introduction by von Basch of the sphygmomanometer into clinical medicine, it became apparent that abnormally high blood pressures in the absence of clinically significant morphologic changes of the kidneys and arteries were not uncommon. This disease or syndrome has been successively called the prealbuminuric stage of chronic Bright's disease, latent arteriosclerosis, hyperpiesia, presclerosis, hypertensive cardiovascular disease and benign or malignant nephrosclerosis; but the ever-increasing and changing nomenclature has not clarified the underlying problem to any great degree, although it has indicated changing concepts. In Bright's original description of chronic nephritis in 1827, he considered the cardiac hypertrophy to be secondary to the underlying renal disease. This concept, carrying as it did such great prestige, prevailed universally until the introduction of the sphygmomanometer in 1893. In the succeeding years, it occurred to such men as Allbutt and Huchard that the hypertension might lead to general arteriosclerosis and thus affect the kidney secondarily. With newer clinical or pathological observation, theories of pathogenesis have alternated between these views.

In an endeavor to elucidate the nature of essential hypertension it was only natural that a pressor substance should be sought. As early as 1898, it was demonstrated that an extract of rabbit kidney produces an inconstant and temporary increase of blood pressure. Due to the inconsistency of this and subsequent results, interest began to lag, only to be revived by Goldblatt's epochal experiments in 1932, which have practically revolutionized this field. Partial clamping of both renal arteries resulted in maximal and prolonged rise of both systolic and diastolic blood pressures, and further experiments suggested that hypertension is produced by a humoral mechanism. It has been supposed that a substance formed in the ischemic kidney may be responsible, but this substance has never been isolated from, or demonstrated in, the circulating blood.

It became apparent that an improved technic of preparing kidney extracts might confirm the former experiments in this direction. Consequently, Dr. Landis and his co-workers embarked on the problem presented herein.

In order properly to interpret the results obtained with any vasopressor substance, it is necessary to understand the fundamental conditions of the circulation in the human hypertensive patient. Prinzmetal and Wilson, as well as Pickering, demonstrated by the plethysmograph that the rate of peripheral blood flow in the forearm remains normal despite greatly increased blood pressure. Furthermore, the response to various thermal and nervous stimuli in hypertension is perfectly normal. There must, therefore, be a generalized increase of peripheral vascular tone and resistance, but with the maintenance of the usual flexibility of tone. In order to determine whether these conditions were met in the experiments, Dr. Landis tested the rabbit's ear for surface temperature and pulse amplitude as a measure of peripheral blood flow and vascular tone.

It was found that heated kidney extract and one of its constituent compounds, tyramine, would each raise the blood pressure of the rabbit by approximately 25 to 35 mm. of mercury. However, the former showed no effect on the skin temperature or amplitude of pulsations, whereas tyramine induced vasoconstriction and decreased blood flow in the ear. Similar injections of epinephrine, Pitressin, Pituitrin-S, guanidine, methyl guanidine, dimethyl guanidine, ergotoxin and ergotamine produced a comparable rise in the blood pressure but also a decrease of the skin temperature and pulse amplitude. Such substances, therefore, temporarily elevate blood pressure by

a mechanism fundamentally different from that found in human hypertension.

It became evident very early in this work by Dr. Landis that the technic of preparing the kidney extracts played an important role in the type of reaction noted. With crude, unheated extract, for instance, the blood pressure might rise, fall or show no change. There was always, however, a conspicuous decrease in the peripheral flow. On the other hand, rabbit kidney extracts heated to 55°C. for twenty minutes and then filtered, uniformly elevated systolic blood pressure 30 or 45 mm., with a slow onset and a duration of thirty to forty-five minutes. Furthermore, there was never decreased peripheral circulation and, in rare instances, even an increased skin temperature was noted. Extracts heated to 60 or 65°C. had no significant effect on blood pressure or peripheral blood flow. Since the amount of protein precipitated increases with the degree of heating, there seems to be suggestive evidence that this is an important fraction in producing hypertension. Dr. Landis emphasized, however, that although the mechanism of vascular tone prevails as in human hyperpiesia, the blood pressure is maintained only temporarily at its elevated level in these experimental rabbits.

Before determining the effect of this extract on Goldblatt rabbits, it was necessary to ascertain whether vascular flexibility comparable to the normal was preserved in these animals. Measurement of the skin temperature of the ear demonstrated that the hypertensive animal was entirely capable of responding to temperature and nervous stimuli by changes of vascular tone. Having established this fundamental similarity, rabbit kidney extract was injected into Goldblatt rabbits with an immediate and temporarily sustained rise of blood pressure from 120 to 180 mm. and with no change in skin temperature or pulse amplitude. The response to this extract, therefore, is obtained regardless of the original base line. And the sensitivity of the hypertensive rabbit is neither more nor less than that of the normal animal, as shown by the same average increase of blood pressure in each instance.

In all these experiments, Dr. Landis has used homologous extracts and donors, due to the general unreliability of results from heterologous injections. To determine the distribution of the hypothetical pressor substance in various species, however, some of the latter type of experiments have been carried out. It is necessary to limit heterologous injections to a single attempt because of subsequent acquired sensitivity. By using kidney extracts from man, rabbit, rat, dog and guinea pig and employing the dog, rabbit, rat and guinea pig as recipients, it was determined that this pressor substance is generally distributed but in various amounts. Thus, the rabbit kidney extract gave an average rise of blood pressure of 43 mm., compared with that from man, which caused an average rise of only 4 mm. On the other hand, the greatest reactivity was demonstrated by extracts from the guinea pig and rat, which were almost twice as responsive as those from the dog. These illuminating data may shed light on previously confusing experimental results.

Various investigators have suggested that some relation may exist between the globulin content of the kidney extracts and their hypertensive potency. Dr. Landis's statistics, however, do not allow him to agree with this postulate, for extracts from all species of laboratory animals contain similar amounts of globulin but exhibit the varying activities enumerated above. Yet the pressor substance of kidney extracts accompanies the globulin fraction, as demonstrated by experiments involving heat precipitation, ultrafiltration and fractional "salting out" by ammonium sulfate.

For assay purposes, human kidney extracts are now being precipitated by half-saturated ammonium sulfate, as well as by heat. The potency of the human extract, however, still falls far short of that from the rabbit kidney. Furthermore, clear-cut pressor effects have so far been obtained only with extracts from kidneys of young individuals with severe malignant nephrosclerosis. The number of human cases so tested, however, is still too small to permit definite conclusions.

Dr. Landis emphasized the fact that experimental hypertension produced by heated kidney extracts is only partially similar to essential hypertension in the human being, for the elevated blood pressure is only temporarily maintained. The speaker also advised caution in drawing any broad conclusions from studies of pressor substances until their presence and effectiveness in the blood stream have been established beyond doubt.

In summary, Dr. Landis again focussed attention on the fundamental dissimilarity between the vascular background of hypertension as produced by the vasoconstrictor drugs on the one hand and suitably heated kidney extract on the other, the latter simulating much more closely the conditions in human hyperpiesia. He said that he believed that these results may point the way for further investigation, but that the "provocative similarity" between the effects of kidney extracts and the circulating mechanics of clinical hypertension offers, at present, no certain proof of the pathogenesis of hypertension in man.

NOTICES

REMOVALS

GEORGE L. TOBEY, JR., M.D., HAROLD G. TOBEY, M.D., CHARLES I. JOHNSON, M.D., LEROY A. SCHALL, M.D., and MERRILL WATTLES, M.D., announce the removal of their offices from 270 Commonwealth Avenue to 403 Commonwealth Avenue, Boston. Telephone KENmore 9620.

ANNOUNCEMENT

JAMES HARRISON, M.D., announces the opening of an office at 120 Needham Street (Riverdale), Dedham.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 3

FRIDAY, JULY 7

*10 a. m. - 12:30 p. m. Boston Dispensary tumor clinic.

SATURDAY, JULY 8

*10 a. m. - 12 m. Staff rounds of the Peter Bent Brigham Hospital. Conducted by Dr. Marshall N. Fulton.

*Open to the medical profession.

JUNE 30 — Salem Hospital Tumor Clinic. Page 1058, issue of June 22.

AUGUST 30 - SEPTEMBER 2 — Seminar in Physical Therapy. Page 857, issue of May 18.

SEPTEMBER — Boston Psychoanalytic Institute. Page 450, issue of September 22, 1938.

SEPTEMBER 4-6 — Institute for the Consideration of the Blood and Blood-Forming Organs. Page 941, issue of June 1.

SEPTEMBER 5-8 — American Congress of Physical Therapy. Page 857, issue of May 18.

SEPTEMBER 11-15 — American Congress on Obstetrics and Gynecology. Page 938, issue of December 8.

SEPTEMBER 14-16 — Biological Photographic Association. Page 941, issue of June 1.

SEPTEMBER 15-28 — Pan-Pacific Surgical Association. Page 863, issue of November 24.

OCTOBER 23 - NOVEMBER 3 — New York Academy of Medicine. Page 977, issue of June 8.

FALL, 1939 — Temperature Symposium. Page 218, issue of February 2.

DECEMBER 2 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

MAY 14, 1940 — Pharmacopoeial Convention. Page 894, issue of May 25.

JUNE 7, 8, 9, 1940 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

BOOK REVIEWS

Dysmenorrhoea. Albert A. Davis. 254 pp. London, New York and Toronto: Oxford University Press, 1938. $4.50.

Davis classifies dysmenorrhea as primary and secondary, according to whether the pain starts with the onset of the menstrual life or some years later, but acknowledges that most of those having a definite pathologic cause fall in the latter group. The chief symptom is described as spasmodic and congestive, the latter applying usually to the secondary type. This book is concerned with the primary type of dysmenorrhea.

Under etiology he considers the incidence of the disease, age of onset, severity, and so forth, giving a good review of the present knowledge. He believes the cause of the pain to be muscular contractions of the uterus, going into detail regarding the normal rhythmic cycles of contractions, and that the contractions are excited by chemical stimulation of the nerve endings. The various theories, such as the obstructive, hormonal, expulsion of endometrial plaques, hypoplastic, allergic, hyperesthetic and neurogenic, are considered in detail. He believes that eventually most cases will be proved to lie in the hormonal and neurogenic fields.

Under hormones he describes the stimulating and inhibiting effects of estrogen and progesterone on uterine contractions and is of the opinion that an imbalance will be proved to be the etiologic factor. The pituitary enters the picture by the stimulating effect of prolan on the ovary and that of pituitrin on the uterine muscle, but he says the degree of their influence has not been decided. He can find no evidence of participation by the thyroid, parathyroid, thymus and adrenal glands. Fifty-five pages are devoted to the neurogenic theory, with a description of the anatomy of the autonomic and somatic nerve supply to the uterus and a discussion of the functions of the different systems regarding which there is a great difference of opinion. He describes inflammatory changes in the ganglion cells of the sympathetic system, which he thinks are characteristic in primary dysmenorrhea and occur in three quarters of the cases. He concludes that: "The pain may be due to exaggeration of either motor or sensory impulses by a nerve rendered hypersensitive through inflammation."

There are good chapters on membranous, secondary and intermenstrual dysmenorrhea.

Under treatment the various constitutional measures, exercises and drugs are first considered. The drugs are taken up in detail, and the various proprietary products listed. He believes that organotherapy is very disappointing, but should be tried, especially the anterior-pituitary-like hormone and small doses of thyroid extract. Alcohol injection into the nerve plexuses on each side of the pelvis where the various uterine nerves come together is described in detail, and 60 per cent of good results reported, but not the number of cases treated. Dilatation of the cervix is a valuable adjunct to other methods, but the use of tents and stem pessaries is condemned. The technic of presacral neurectomy is well described, as well as its difficulties and dangers. He finds that 75 per cent are cured and the rest much relieved, and recommends that it be reserved for failures after simpler types of treatment.

There is a bibliography of 28 pages.

This is a sensible, well-written book which would be more convincing if series of cases were tabulated for each of the chapters; however, it gives a complete picture of the subject.

Principles of Hematology. Russell L. Haden. 348 pp. Philadelphia: Lea & Febiger, 1939. $4.50.

For a long time, there were no American texts on hematology. In the last few years, there has been a bumper crop, and almost every hematologist of note has contributed his opus — Castle and Minot, Downey, Osgood, Kracke, Sturgis and Isaacs, Murphy and, now, Haden. Some say, rather cynically, that textbook writing in any field is a sure sign of its approaching decadence. In the feverish decade of activity in hematology, dating from 1926, textbooks were scarce, although advances were many. Is the order now to be reversed? The monumental *Handbook of Hematology*, edited by Downey, is undoubtedly the most erudite American work in this field, and serves only a limited audience. Haden's book, on the other hand, is aimed quite frankly at the much larger field which includes the general practitioner. The wealth of illustrations is perhaps the outstanding feature of the book. Although no colored lithographic plates are present, the photographs are mostly carefully selected and excellently executed; they actually illustrate. Unless one customarily thinks in visual terms, as the author apparently does, some of the numerous diagrams may on occasion be confusing. One may question the wisdom of illustrating even the smallest point by a mechanistic diagram.

Surrounding this mass of illustrations is a rather small amount of text. Probably in the interests of simplicity, the wording is often quite dogmatic, and controversial subjects are dismissed with a few words. The reader's interest, however practical it may be, is rarely stimulated to go a little more deeply into a given subject. (The entire bibliography consists of thirty-nine references.)

The several chapters on methods, on granulocytes and their reactions, and on the treatment of anemia and polycythemia are good. The chapter on the mechanism of anemia and polycythemia might be improved if some of the many diagrams were omitted. Far too much attention seems to be paid to the volume and saturation indices, rarely used by the general practitioner. The statement that small transfusions are valuable for a stimulating effect on the bone marrow is to be doubted. Bone-marrow biopsy — whether by trephine or puncture — is neither described nor discussed. Despite their widespread use there is very little on transfusions or blood storage and nothing regarding methods of blood typing. The heterophil agglutination test for infectious mononucleosis is dismissed with a simple mention, and this important disease is considered in only one of the one hundred case reports given at the end of the book. There is no mention of vitamin K and its relation to prothrombin.

Despite its deficiencies, the book will probably prove to be popular with the general practitioner desiring an introduction to hematology. The illustrative cases are well selected and without question a valuable feature. The book undoubtedly represents a sincere attempt to educate the average physician, and for this it should be commended.

Injections of the Hand: A guide to the surgical treatment of acute and chronic suppurative processes in the fingers, hand and forearm. Allen B. Kanavel. Seventh edition. 503 pp. Philadelphia: Lea & Febiger, 1939. $6.00.

It is a sad privilege to review this seventh edition of the late Dr. Kanavel's classic work. The publishers' note should be read. The volume is more compact than the sixth edition. The type, the number of chapters and the chapter headings are the same. Changes in phraseology have been

made throughout. Some chapters have been condensed and others expanded. A half dozen illustrations have been omitted, another half dozen altered, and fully twenty new ones introduced. Nevertheless the new edition is shorter by forty pages.

An oblique, rather than a vertical, incision through the radial border of the palm is described for drainage of the thenar space. A more or less transverse incision, often directly along the distal flexion crease, is being used for draining the middle palmar space, rather than the earlier vertical incision. Roentgen irradiation in therapeutic doses in the early stages of infection has been found of value since the publication of the sixth edition. A considerable addition has been made concerning the treatment of chronic undermining burrowing ulcers with zinc peroxide, after the method of Meleney. Only cautious references are made to the use of sulfanilamide as an adjunct to surgery. This is consistent with Dr. Kanavel's purpose that all the editions of his monograph be safe and sound guides for the practitioner. His life was cut short before the scientific control of the administration of the drug had been developed.

The exposition of the anatomy of the palm is fundamentally the same as in the sixth edition: a radial bursa connected with the flexor pollicis longus sheath; a thenar space into which drain the flexor tendon sheath and the lumbrical canal of the index finger; an ulnar bursa into which usually drains the flexor sheath of the little finger, and separate from it a middle palmar space into which usually drain the remaining flexor sheaths and lumbrical canals. Although some students of the hand have not been in entire agreement with this arrangement of the palmar structures a recent study from the Department of Anatomy and Surgery at Western Reserve University School of Medicine has challenged the identity of a middle palmar space and demonstrated an adductor space unassociated with the tendon sheath and lumbrical canal of the index finger.

In the foreword of this work Dr. T. Wingate Todd writes: "To both Dr. Brickel and myself it is a matter of deepest dismay that at the very moment when we should have wished to consult with Dr. Kanavel on this important work Fate intervened and left us to carry on without his constructive criticism and approval."

Dr. Kanavel's monograph is a classic work on hand infections and since its first appearance in 1912 has doubtless contributed more than any other to the intelligent treatment of this heretofore sadly neglected field of surgery.

Surgical Treatment of Hand and Forearm Infections. A. C. J. Brickel. 300 pp. St. Louis: C. V. Mosby Co., 1939. $7.50.

This carefully prepared monograph comes from the Department of Anatomy and Surgery of Western Reserve University. The foreword by T. Wingate Todd should be read.

The work may be divided into two parts, anatomical and clinical. The clinical considerations concern chiefly the regional surgery of the usual pyogenic infections. To these are added the management of specific infections and human bites, the influence of diabetes and peripheral vascular disease, and the medicolegal aspects of hand injuries.

The anatomical text consists of descriptions of 14 excellent plates (10 in color). The clinical significance of the structural arrangement is epitomized in notes at the end of each description. The usual and occasional extent and relations of bursas and spaces are further set forth in the description of 17 plates and a diagram of roentgenograms of radiopaque injections. The whole is beautifully done. The generally accepted concept of a thenar space, into which projects the flexor tendon sheath of the index finger, separated from a mid-palmar space by a septum along the third metacarpal, is not confirmed by Brickel's findings. His studies show that the proximal portion of the palmar cavity is a common space which is usually filled by the ulnar bursa and its enclosed tendons and that it is continuous with a distal portion which is divided into compartments by septums separating the lumbrical canals and the tendon sheaths. Each lumbrical canal is connected distally with a web space but proximally with the common synovial cavity. The radial and ulnar bursas are usually separated, but in some hands there is a communication between them. This may be valve-like in character, thus preventing the spread of pus from one to the other, but on decompression by drainage of the infected bursa the effectiveness of this barrier may be lost. The term, thenar space, is discarded for the more descriptive term, adductor space, anterior and posterior.

Although the author emphasizes the necessity of making lateral drainage incisions in the fingers dorsal to the digital vessels and although he quite properly insists that drainage material must not press against the tendons or pass beneath them, he unfortunately does not describe the intimate blood supply of the tendons themselves. Mesotenons are neither mentioned nor illustrated. Although it is stated that the use of 70 or 80 gr. of sulfanilamide in divided doses each day for four days has been found of great benefit in cases of streptococcal and staphylococcal infections as an adjunct to surgery and although caution against individual susceptibility and the coincident employment of external or internal sulfates is advised, no detailed information concerning the scientific control of its administration is given.

This monograph is a valuable contribution to the subject. To a student of the hand it is fascinating. Certain anatomical features which it presents should stimulate further investigation of this economically important member of the body. The book should be carefully studied by all general surgeons and practitioners who undertake the treatment of hand infections.

Immunity: Principles and application in medicine and public health. Hans Zinsser, John F. Enders and LeRoy D. Fothergill. Fifth edition. 801 pp. New York: The Macmillan Co., 1939. $6.50.

The present edition enlarges the scope of the usefulness of this book. It has been written to reach a much larger group of readers than the former editions, and by the elimination of much of the older material and by the detailed discussion in Section II of the application of immunological knowledge to medicine and public health, it has become a volume which might well be placed in the library of every physician.

In Section I the authors discuss the general principles of immunology in such chapters as "Infection and Virulence," "Toxin-Antitoxin Reactions," "The Basis of Immunity," "Iso-antibodies and the Blood Groups," "Hypersensitiveness," and so forth.

In Section II the immunological problems in individual infections are discussed. Among these are chapters on virus diseases, diphtheria, scarlet fever, other hemolytic streptococcal infections, staphylococcal infections, pneumonia, whooping cough, syphilis and tuberculosis.

The writers' thorough understanding of the subject and gift at expressing this knowledge make the mental transference of this information to the reader an exhilarating experience.